

PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS
(INSTITUTED 1852)

VOL. XXXVII—No. 7
SEPTEMBER, 1911

Edited by the Secretary, under the direction of the Committee on Publications.

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CONTENTS

Society Affairs.....	Pages 409 to 474.
Papers and Discussions	Pages 993 to 1056.

NEW YORK 1911.

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American Society of Civil Engineers

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ON BITUMINOUS MATERIALS FOR ROAD CONSTRUCTION: W. W. Crosby, A. W. Dean, H. K. Bishop, A. H. Blanchard.

The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.
CABLE ADDRESS....."Ceas, New York."

AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed
in its publications.

SOCIETY AFFAIRS

CONTENTS

	PAGE
Minutes of Meetings:	
Forty-third Annual Convention, June 13th-16th, 1911.....	409
Of the Society, September 6th, 1911.....	410
Of the Board of Direction, September 5th, 1911.....	414
Report in full of the Business Meeting, June 14th, 1911, at the Forty-third Annual Convention.....	415
Excursions and Entertainments during the Forty-third Annual Convention.....	425
Attendance at the Forty-third Annual Convention.....	426
Announcements:	
Hours during which the Society House is open.....	428
Future Meetings.....	428
Searches in the Library.....	428
Papers and Discussions.....	429
Local Associations of Members of the American Society of Civil Engineers.....	429
Privileges of Engineering Societies Extended to Members.....	430
Accessions to the Library:	
Donations.....	433
By purchase.....	436
Membership (Additions, Changes of Address, Resignations, Deaths).....	438
Recent Engineering Articles of Interest.....	447

MINUTES OF MEETINGS

OF THE SOCIETY

FORTY-THIRD ANNUAL CONVENTION, HELD IN CHATTANOOGA,
TENN., JUNE 13TH-16TH, 1911.

FIRST SESSION*

Tuesday, June 13th, 1911.—The meeting was called to order at 10.25 A. M.; President Mordecai T. Endicott in the chair; Chas. Warren Hunt, Secretary; and present, also, about 125 members and guests.

The President introduced the Honorable T. C. Thompson, Mayor of Chattanooga, who welcomed the members to the city.

At the conclusion of Mr. Thompson's remarks, the President delivered the Annual Address.†

* For the report in full of this and the Business Meeting, see page 415.

† The President's Address is printed in *Transactions*, Vol. LXXIII, page 392.

BUSINESS MEETING

Wednesday, June 14th, 1911.—Second Session.—The meeting was called to order at 10 A. M.; President Mordecai T. Endicott in the chair; Chas. Warren Hunt, Secretary; and present, also, about 75 members.

The Secretary presented a report giving the suggestions of members as to the Time and Place for holding the Annual Convention of 1912.*

On motion, duly seconded, the matter of the selection of the Time and Place for holding the next Annual Convention was referred to the Board of Direction, with power.

The Secretary read his report to the Board of Direction in reference to proposed changes in the method of issuing the publications of the Society.†

The Secretary read a communication from Emile Low, M. Am. Soc. C. E., in reference to changing the size of the publications of the Society.‡

On motion, duly seconded, the matter was referred to the Board of Direction.

Adjourned.

Wednesday, June 14th, 1911.—Third Session.—The meeting was called to order at 8.30 p. m.; President Mordecai T. Endicott in the chair; Chas. Warren Hunt, Secretary; and present, also, about 120 members and guests.

George F. Rowell, M. Am. Soc. C. E., described the Lock and Dam of the Chattanooga and Tennessee River Power Company at Hale's Bar, illustrating his remarks with lantern slides.

Adjourned.

September 6th, 1911.—The meeting was called to order at 8.30 p. m.; Vice-President Talbot in the chair; Chas. Warren Hunt, Secretary; and present, also, 113 members and 24 guests.

The minutes of the meetings of May 17th and June 7th, 1911, were approved as printed in *Proceedings* for August, 1911.

A paper by George B. Francis and Joseph H. O'Brien, Members, Am. Soc. C. E., entitled "The New York Tunnel Extension of the Pennsylvania Railroad: Certain Engineering Structures of the New York Terminal Area," was presented by Mr. O'Brien, who illustrated his remarks with lantern slides. A written communication on the subject by Charles B. Buerger, Assoc. M. Am. Soc. C. E., was presented by title by the Secretary.

* See page 417.

† This report was printed in *Proceedings* for August, 1911, pages 319 to 321.

‡ See page 421.

The Secretary announced the election of the following candidates on September 5th, 1911:

AS MEMBERS.

JAMES WADSWORTH ARMSTRONG, New York City.
ALBERT WELLS BUEL, New York City.
CHARLES ADOLPHUS CALDWELL, Macon, Ga.
HALVOR OLSEN HEM, Kansas City, Mo.
CHARLES HUBBARD HERRICK, Boston, Mass.
FRANK HALL JOYNER, Los Angeles, Cal.
WILLIAM SMELSOR MOORE, South Bend, Ind.
EZRA BOOTH NAYLOR, Nanking, China.
FRANCIS EVERETT PRATT, Glen Ridge, N. J.
ELTON RICE, Massillon, Ohio.
PAUL DUDLEY SARGENT, Washington, D. C.
FRANCIS GEORGE SOMNER, Chico, Cal.
CHARLES HERBERT SWEETSER, Olympia, Wash.
EDMOND CORNELIS VAN DIEST, Colorado Springs, Colo.

AS ASSOCIATE MEMBERS.

DAVID MORRICE BROCK, Memphis, Tenn.
MELVIN DAVID CASLER, Mt. Vernon, N. Y.
JOHN HALSEY CROSS, Quebec, Que., Canada.
GEORGE ALEXANDER MILLER ELLIOTT, San Francisco, Cal.
EARL JEROME ELLISON, Maywood, Ill.
HERMAN HENRY FOX, Kansas City, Mo.
DOUGLAS BASIL ADAIR GRAHAM, Chicago, Ill.
LLOYD MURRAY GRANT, Seattle, Wash.
WILSON GARDNER HARGER, Rochester, N. Y.
BRUCE RITCHIE HONEYMAN, Portland, Ore.
JEAN GEORGES LEFEBVRE HOPPER, San Francisco, Cal.
SHALER CHARLES HOUSER, Guantanamo, Cuba.
GED HARDY JUSTICE, Hazard, Ky.
WILLIAM MATHER LAMSON, New York City.
DANIEL HANDLEY McALLISTER, Provo City, Utah.
OSCAR ALEXANDER MECHLIN, Washington, D. C.
ARTHUR POMEROY MELTON, Gary, Ind.
CHARLES AUGUSTIN WOODLEY MUSSON, Butte, Mont.
WILLIAM WORTH PEARSE, New York City.
CHARLES EDWARDS PERRY, Canajoharie, N. Y.
CASSIUS MORTON PHINNEY, Sacramento, Cal.
THOMAS DAY PIERCE, Cleveland, Ohio.
FREDERICK HOSEA RICHARDSON, Caldwell, Idaho.
EDWARD MARSHALL ROSHER, Sagua la Grande, Cuba.
EDWARD EMMET SANDS, Powell, Wyo.

EDWARD FREDERICK SINZ, Guantanamo, Cuba.
FRANK CHARLES STARR, Washington, D. C.
EMORY SUDLER, Baltimore, Md.
ALFRED VON SILLER, New York City.
JAMES JOSEPH WALSH, San Francisco, Cal.
RALPH MERVINE WARFIELD, Bremerton, Wash.
ALEXANDER RIRIE YOUNG, Topeka, Kans.

As ASSOCIATE.

JAMES DYNAN NEWTON, Chicago, Ill.

As JUNIORS.

CARL MATHIAS DUFF, Boulder, Colo.
STUART CHAPIN GODFREY, Washington, D. C.
JOHN ADAM GUISSINGER, Helena, Ark.
JOHN GIBSON HENDRIE, Perth Amboy, N. J.
CLARENCE EDWARD LONG, Pittsburg, Pa.
LEO FRANCIS MURPHY, Delray, Mich.
GEORGE AMOS PAYNE, Clearing, Ill.
HAROLD PERRINE, New York City.
LOUIS POWERS, Elizabeth, N. J.
ROBERT LAWRENCE ROLFE, Memphis, Tenn.
CLARENCE URLING SMITH, Spokane, Wash.
NELSON TAYLOR, Los Angeles, Cal.
EDGAR LOUIS THOMSSSEN, Toledo, Ohio.
HOWARD SLOAN THORNE, Toledo, Ohio.
WILMER CHARLES VAN DUYN, East Orange, N. J.
WILLIAM COOPER WALKER, Syracuse, N. Y.

The Secretary announced the transfer of the following candidates on September 5th, 1911:

FROM ASSOCIATE MEMBER TO MEMBER.

FREDERIC HERBERT BASS, Minneapolis, Minn.
JOHN POTTER CONGDON, Pocatello, Idaho.
MANSFIELD JOSEPH FRENCH, Utica, N. Y.
GEORGE ALBERT NOSKA, New York City.
JOHN KIMBALL SCAMMELL, St. John, N. B., Canada.
ARTHUR MONROE SHAW, New Orleans, La.
ALFRED WALTON STOCKETT, Germiston, Transvaal, South Africa.
GRANVILLE LEWIS TAYLOR, Wilkinsburg, Pa.
WILLIAM HAMMOND WAUGH, Manila, Philippine Islands.
HANS HERMANN WOLFF, Seattle, Wash.

FROM ASSOCIATE TO MEMBER.

THOMAS FRANK QUILTY, Chicago, Ill.

FROM ASSOCIATE TO ASSOCIATE MEMBER.

GEORGE MERRICK HERRON, Palo Alto, Cal.

EDWARD PERCIVAL THOMPSON, Manila, Philippine Islands.

FROM JUNIOR TO ASSOCIATE MEMBER.

GEORGE WILLIAM BURPEE, Merivale, Ont., Canada.

CLINTON HERVEY CROOKS, New York City.

CLARENCE SYLVESTER JARVIS, Provo, Utah.

JEREMIAH DANIELS RICHARDSON, Corona, N. Y.

CHARLES SCHULTZ, Muskogee, Okla.

MARION DEKALB SMITH, Jr., Chestertown, Md.

JOHN ROBERT WILBANKS, Little Rock, Ark.

CHARLES RAPELYEA WYCKOFF, Brooklyn, N. Y.

The Secretary announced the following deaths:

JAMES CHRISTIE, elected Member May 7th, 1873; died August 24th, 1911.

FRANCIS COLLINGWOOD, elected Member March 3d, 1869; died August 18th, 1911.

CHARLES ARTHUR HAGUE, elected Member February 3d, 1892; died June 25th, 1911.

EDWARD MARION KENLY, elected Member May 4th, 1904; died June 10th, 1911.

WALLACE MCGRATH, elected Member September 5th, 1883; died December 5th, 1909.

EDWARD P. NORTH, elected Member December 4th, 1867; died July 20th, 1911.

HENRY PIERCE, elected Member December 5th, 1894; died August 21st, 1911.

ALFRED FRANCIS SEARS, elected Member June 2d, 1869; died June 7th, 1911.

WILLIAM DANA TAYLOR, elected Member March 1st, 1899; died August 26th, 1911.

JOSEPH CANBY HADSALL, elected Associate Member November 8th, 1909; died June 29th, 1911.

HOMER AUSTIN PATCH, elected Associate Member January 8th, 1908; died April 4th, 1911.

JOSEPH HECKART FRAZER, elected Junior March 31st, 1908; date of death unknown.

RICHARD HAZEN, elected Junior November 8th, 1909; died August 13th, 1911.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

September 5th, 1911.—Vice-President Boller in the chair; Chas. Warren Hunt, Secretary, and present, also, Messrs. Bates, Clarke, Kimball, Knap, Loomis, Loweth, Ridgway, Snow, Stuart, Talbot, and Thompson.

Upon a favorable report from the Publication Committee, the change, suggested some time ago by the Secretary, in the method of issuing *Transactions*, viz., to issue one volume per annum instead of four, during 1912, was adopted.

The Report of the Nominating Committee was received.

At the request of the Special Committee on Bituminous Materials for Road Construction, the Board authorized the holding of meetings for the discussion of Road Construction on the Friday and Saturday next succeeding the days of the Annual Meeting of 1912.

Ballots for membership were canvassed, resulting in the election of 14 Members, 32 Associate Members, 1 Associate, and 16 Juniors, and the transfer of 8 Juniors to the grade of Associate Member.

Ten Associate Members and one Associate were transferred to the grade of Member, and two Associates were transferred to the grade of Associate Member.

Applications were considered, and other routine business transacted.

Adjourned.

REPORT IN FULL OF THE FIRST SESSION OF THE FORTY-THIRD
ANNUAL CONVENTION, AND OF THE BUSINESS MEETING,
HELD IN THE ASSEMBLY HALL
OF THE HOTEL PATTEN, CHATTANOOGA, TENN.

FIRST SESSION

Tuesday, June 13th, 1911.—The meeting was called to order at 10.25 A. M.; Mordecai T. Endicott, President, in the chair; Chas. Warren Hunt, Secretary; and present, also, about 75 members and many guests.

THE PRESIDENT.—Coming here to open the 43d Annual Convention of the American Society of Civil Engineers, is His Honor, the Mayor of the City, who is here to welcome you to Chattanooga. I beg to introduce the Honorable T. C. Thompson.

HON. T. C. THOMPSON.—Mr. President, Ladies and Gentlemen, in the latter part of 1864, when Bragg began his retreat from Missionary Ridge to Dalton, he gave orders that there should be no stragglers, as his army was then very few in numbers. Among others, a minister of the gospel was sent out to keep up the stragglers. Just at the edge of Missionary Ridge, on the way to Chickamauga Park, this parson, who was pretty well fed, splendidly dressed, and pretty well mounted, met a soldier and said to him: "You are not obeying orders. The orders are that straggling shall not be permitted in this army on this retreat. What command do you belong to?" The soldier replied, "I belong to Hood's Texas Rangers." The chaplain retorted: "Your headquarters are four miles to the front; you must hurry on and keep up." The soldier said: "They have kept me fighting all day and marching all night. I am doing the best I can. I will catch up with headquarters after a while." The parson started to ride off, and the soldier called to him: "Captain, what army do you belong to?" He drew himself up proudly, and said: "I belong to the Army of the Lord." The private answered: "Well, you are a ——— sight farther from your headquarters than I am from mine."

Address of
welcome.

It is true, Mr. President, that I would be just a little bit away from headquarters, in addressing the American Society of Civil Engineers, except for this fact: I sat at the feet of a man who was a chief of artillery in the late unpleasantness, and a graduate of West Point. He was a distinguished civil engineer, and after the war he naturally returned to his chosen profession. So, with this little experience, I might not be so very far from headquarters after all.

I have the honor of extending to you the hospitality of this busy and cosmopolitan community, for which I speak to-day and from which I bring you welcome. Probably no city in America to-day

Address of
welcome
(con-
tinued).

more truly typifies the American spirit than this city. Down here we do not know any North, any South, any East, or any West. I am the son of an American soldier, and I am proud of it, but I defy any one of you to tell whether he fought in the blue or in the gray uniform. I am an American myself. That is what we particularly stand for—Americanism.

When you go down to Chickamauga Park, please bear these facts in mind. I do not wish to bore you with dry figures, but perhaps the greatest battle of the late war was fought with that beautiful setting, where 59 000 men were opposed to 40 000 others in a death grapple. When they separated one army held the field and the other held Chattanooga. Neither side won and neither side lost. Out of the 99 000 engaged, 38 000 were left on that field. Even Gettysburg cannot show such figures. The Confederates fought well at Chickamauga, but they lost. Had they won, it would have changed American history, as well as that of Chattanooga. The backbone of the Confederacy was broken in that engagement, resulting in the retaining of the Union.

Just another remark before I close: Kentucky has erected a monument to its soldiers, on both sides, who fought and died there. The people of Chattanooga would like you to see the inscription on that monument. It reads something like this:

"As we are united in life and they united in death, let one monument perpetuate their deeds, and one people, forgetful of all asperities, forever hold in grateful remembrance all the glories of that terrible conflict, which made all men free and retained every star on the Nation's flag."

Now, ladies and gentlemen, it is in that spirit that Chattanooga bids you men from all over this great nation welcome to our city, and says to you: "Whatever is ours is yours." (Applause.)

Reply to
address of
welcome.

THE PRESIDENT.—Your Honor, we thank you very much for this pleasant and gracious welcome to your city. It is not the first time that the American Society of Civil Engineers has visited you. Yesterday morning, as I was passing through the prosperous, beautiful country of Southwest Virginia and the eastern part of this State, with its towering mountains, fertile valleys, and beautiful plains, it seemed to me that it was, and it is, an ideal approach to your pleasant, beautiful, and delightful city. We can take away with us many memories of things which have charmed us and attracted our interest; and, I think I can say, more than anything else, that which every Southern city has—gallant and chivalrous men and beautiful and attractive women. I am sure that our sojourn here will be pleasant and will equal our anticipations. (Applause.)

(The President then delivered the Annual Address.*)

* *Transactions, Am. Soc. C. E., Vol. LXXIII, p. 392.*

THE SECRETARY.—Mr. President, the programme of the Convention was sent out to the members of the Society some time ago, and copies have been distributed; but there have been some changes, and, as the work was done by a local committee and the chairman of that committee is present, we should like to hear from him now as to the changes which have been made.

(William Dunbar Jenkins, M. Am. Soc. C. E., Chairman of the Local Committee, then announced the principal features of the programme, as finally arranged.)

THE PRESIDENT.—Mr. Secretary, are there any more announcements?

THE SECRETARY.—No, Mr. President, I do not know of anything else, sir.

THE PRESIDENT.—The meeting will stand adjourned.

BUSINESS MEETING

Wednesday, June 14th, 1911.—The meeting was called to order at 10 A. M.; Mordecai T. Endicott, President, in the chair; Chas. Warren Hunt, Secretary, and present, also, about 75 members.

Business Meeting called to order.

THE SECRETARY.—The only business to come before this meeting is the consideration of the time and place for holding the next Annual Convention. I have a report on that subject which I will read.

Report of the Secretary on Suggestions Received as to the Time and Place for Holding the Annual Convention of 1912.

"On May 12th, 1911, a circular was sent to the entire membership of the Society in order that each member might express his particular preference as to the place for holding the next Annual Convention, and as to the time most suitable for holding it.

Convention of 1912.

"In response to this circular 354 suggestions have been received, which may be summarized as follows:

Baltimore, Md.....	33	Pittsburg, Pa.....	11
Seattle, Wash.....	18	Saratoga, N. Y.....	9
Atlantic City, N. J.....	17	Chicago, Ill.....	8
Detroit, Mich.....	17	Minneapolis, Minn.....	8
Boston, Mass.....	16	Mackinac Island, Mich.....	7
New Orleans, La.....	16	Niagara Falls, N. Y.....	6
New York City.....	13	Kansas City, Mo.....	6
Los Angeles, Cal.....	13	Salt Lake City, Utah.....	6
San Francisco, Cal.....	13	Sault Ste. Marie, Mich.....	6
Portland, Ore.....	12	Buffalo, N. Y.....	5
Denver, Colo.....	11	Rochester, N. Y.....	5
Duluth, Minn.....	11	Washington, D. C.....	5

Convention of 1912 (con- tinued).	Ottawa, Ont., Canada.....	4	Cooperstown, N. Y.....	2
	Louisville, Ky.....	4	Atlanta, Ga.....	2
	Quebec, Que., Canada.....	4	Kineo, Me.....	2
	Steamer on Great Lakes....	3	Montreal, Que., Canada....	2
	Milwaukee, Wis.....	3	Norfolk, Va.....	2
	Panama	3	Portland, Me.....	2
	Philadelphia, Pa.....	3	Providence, R. I.....	2
	St. Louis, Mo.....	3	Watch Hill, R. I.....	2

"The following have received one vote each:

Adirondacks.	Orange, N. J.
Albany, N. Y.	Paris, France.
Birmingham, Ala.	Phoenix, Ariz.
Boise, Idaho.	Pittsfield, Mass.
Canal Zone, Panama.	Richmond, Va.
Cape May, N. J.	Roanoke, Va.
Colorado Springs, Colo.	Savannah, Ga.
Dallas, Tex.	Spokane, Wash.
Galveston, Tex.	St. Paul, Minn.
Great Falls, Mont.	Tampa, Fla.
Harrisburg, Pa.	Thousand Islands, N. Y.
Havana, Cuba.	Toledo, Ohio.
Helena, Mont.	Yellowstone National Park.
Hot Springs, Va.	Winnipeg, Man., Canada.
Houston, Tex.	Yosemite Valley, Cal.
Lexington, Ky.	On board a steamer sailing from
Memphis, Tenn.	New Orleans to Colon and
Mobile, Ala.	return.
Near Great Lakes.	Some Western City.
Oklahoma, City, Okla.	Twin Cities, St. Paul and Minne-
Old Point Comfort, Va.	apolis.

"As to the time for holding the Convention, there is a great variety of opinion:

January has received....	1 vote.	October	8 votes.
February	4 votes.	March or April.....	1 vote.
March	4 "	April or May.....	2 votes.
April	3 "	May or June.....	2 "
May	29 "	May or September.....	1 vote.
June	188 "	June or July.....	9 votes.
July	40 "	June or September....	1 vote.
August	4 "	June or October.....	1 "
September	11 "	July or August.....	2 votes.

September or October...	1 vote.	Late Fall or Winter.....	1 vote.
December or January..	1 "	Just before or after the	
Any time between June		time of the XIIth In-	
1st and September 30th.	2 votes.	ternational Congress of	
Early Spring	1 vote.	Navigation	1 "
Spring	1 "	In cool weather.....	1 "
Easter Vacation.....	1 "	In the "good old summer	
Fall	1 "	time"	1 "
Late Fall.....	1 "		

"Respectfully submitted,

"CHAS. WARREN HUNT,
"Secretary."

Mr. President, I have some letters advocating the holding of the Convention at different places. One is from a member residing in Cooperstown, and there is also an invitation from the Engineers' Club, of Baltimore, which is as follows:

"ENGINEERS' CLUB OF BALTIMORE,
"BALTIMORE, Md., May 19th, 1911.

"Mr. CHARLES WARREN HUNT,
"Secretary, American Society Civil Engineers,
"220 W. 57th Street, New York City.

"DEAR SIR: The Engineers' Club, of Baltimore, at its meeting on April 27th, 1911, unanimously passed a resolution respectfully inviting the American Society of Civil Engineers to hold its annual convention for the year 1913 in the City of Baltimore, and I have the honor herewith to submit this invitation.

"The Club, in extending this invitation, has the indorsement of the Mayor and City Council, the Board of Trade, and other similar organizations of the City; and at the proper time full information as to entertainment, hotel accommodations, etc., will be supplied by the Publicity Bureau.

"In the City and its suburbs there is being spent fifty million dollars (\$50,000,000) in constructing the most comprehensive sewerage system, a most comprehensive municipal system of docks, a twenty billion gallon impounding reservoir and filter plant, a high-pressure fire system, the only ozone water-sterilizing plant in the country, a most comprehensive system of parks and boulevards, and many miles of improved street paving, etc., etc.

"The Club will send official delegates to the coming convention of the Society in Chattanooga who will be delighted to supply you with any information you may wish, or you may obtain any additional data directly from me.

"Very respectfully,
"JAS. W. SINKLY,
"President."

Convention
of 1912
(con-
tinued).

THE PRESIDENT.—You have heard the suggestions that have been made as to the various places and various dates. What is the pleasure of the meeting? Shall we decide that at this time, or refer the matter to the Board of Direction, as has been done in many instances in the past?

(On motion, duly seconded, it was ordered that the matter of the time and place for the next Annual Convention be referred to the Board of Direction, with power.)

Change in
Method of
Publishing
*Transac-
tions.*

THE SECRETARY.—Mr. President, a matter which is of general interest to the members of the Society is a proposed change in the method of publishing the *Transactions*. I have submitted a report to the Board of Direction, and the subject is now under consideration.

(The Secretary read his report on the proposed change in the method of Society Publications.*)

THE SECRETARY.—I feel that I should state to the Meeting the purposes of this proposed change. We will have the same amount of material, and probably more discussions. In place of four separate volumes with four separate indexes, occupying quite a large space, there will be one volume, the thickness of which will be a little less than half the aggregate of the four. The fact that we would only have to get out one volume a year would enable us to prolong the discussions for several months, if necessary, whereas the present system frequently shuts them out. For instance, I received a very interesting discussion from a member in the Philippines, and he had evidently written it as soon as he got the paper, but, owing to the fact that the volume had gone to press, his discussion was shut out.

A MEMBER.—Does the recommendation of the Secretary include a reduction or change in the size of the volume?

THE SECRETARY.—Yes, sir.

A MEMBER.—Will the *Proceedings* and the discussions be bound together, or will they be separated as now, that is, will the volume contain the *Proceedings* of the Society and also the discussions?

THE SECRETARY.—The *Proceedings* as now issued consist of two parts, one part contains Society Affairs and one contains the papers in advance of the time they are to be presented to the Society for discussion. This part also contains discussions of papers which have been presented. That method will be continued. The effect of the proposed change, in my opinion, will be to stimulate cross-discussion and produce more than is possible under the present system. Each paper is published in the *Proceedings* some six weeks, perhaps, before it is presented to the Society. It comes up at a stated meeting, and all the discussions we can get are printed in the next number of *Proceedings*; then we have to wait thirty days longer before the discussion can be closed. If the discussion was continued for another

* Printed in the *Proceedings* for August, 1911, p. 319.

month, it would mean that the paper would have to be held open three months, but with only one volume of *Transactions* a year, it would not be necessary to close the discussion so soon. There is another feature of the proposed change: Members would not have to wait for separate copies of a paper until the volume is published, for copies would be available just as soon as the discussion is closed, as the paper would go through the press perhaps six months or more before the volume was issued.

I have a letter from a Member addressed to the members of this Society in Annual Convention assembled, which I presume should be read.

Proposed
change in
size of Pro-
ceedings
and Trans-
actions.

"606 Ashland Avenue,
"BUFFALO, N. Y., June 10, 1911.

"To the Members of the
"American Society of Civil Engineers,
"Annual Convention, 1911,
"Chattanooga, Tenn.

"GENTLEMEN: At the present time there is a marked tendency toward standardization and uniformity in all branches of business.

"The vertical system of filing has revolutionized the method of filing letters, documents, catalogs, and kindred matter, certainly an improvement over the old method of folding and filing in boxes, with its inherent defects not necessary to mention here.

"With the introduction of the vertical filing system, the old-time sizes of publications are also being changed so as to correspond with the ordinary size of letter heads, which is 8 x 10½ inches.

"In view of these facts I would respectfully suggest that the size of the *Proceedings* and *Transactions* of the Society be changed to 8 x 10½ inches.

"Some letters bearing on this subject accompany this communication.

"Very respectfully,

"EMILE LOW,

"M. Am. Soc. C. E."

(On motion, duly seconded, it was ordered: That this subject be referred to the Board of Direction.)

THE PRESIDENT.—Major Jenkins, of the local committee, has some announcements to make.

MAJOR JENKINS.—Members of the Society, I am pleased to state that a party is being made up to visit Lookout Mountain this afternoon. As I see no ladies present, I know all who came with ladies will give them this information. The trip will be made on the regular cars and incline. The cars can be taken at Ninth and Market Streets, about a block and a half up the street. They are all marked "Lookout Mountain." The ladies of the local committee will serve a basket picnic lunch, and the party will return to the hotel at about 7.00 P. M. The members and guests are invited.

Announce-
ments
(con-
tinued).

A MEMBER.—At what time?

MAJOR JENKINS.—The cars will leave at 3 P. M.

THE SECRETARY.—Are those special cars, Major?

MAJOR JENKINS.—I suppose that special cars will be arranged for the accommodation of the party at that time, but if any one should miss the special cars he can get out to the incline on the regular cars and take the incline cars to the top. I wish to call attention to the fact that on Friday, June 16th, at 11 o'clock, we are to take the cars—special coaches—about a block from the hotel, at the T. A. G. Station, and go to the water-works. Those who take this trip will be much interested. They will be entertained by Mr. Bixby, the General Manager. A luncheon will be served after the plant has been inspected. I suppose the trip will consume about two hours; but, as a golf tournament is to be held at the Golf and Country Club that afternoon, we would like the members to return from the water-works as soon as possible. They can return and take the street cars to the Golf and Country Club as soon as they arrive at the station in Chattanooga. This tournament will be given on Friday afternoon, June 16th, and the local committee has offered five prizes, two for gentlemen, consisting of first and second prize, for the best medal score, also prizes for the ladies, if any take part in the tournament, and there is one prize for the longest drive. These events will be open to all members and guests, and we request that all golfers among the engineers will register their names with the Secretary's assistant in the writing-room at the hotel. Even if they are not expert, they should all go out to the tournament, as they will enjoy it, I am sure. It is hoped that there will be a large attendance, as the privileges of the club have been extended to the Society and friends, and to all the ladies.

As stated yesterday, there will be an excursion to the Lock and Dam to-morrow, leaving the Union Station at 9.30 A. M. We will go by rail, as the stage of the water in the river does not permit of navigation.

THE SECRETARY.—I would like to ask if this train is going to move promptly at 9.30? The difficulty of getting the members to the Business Meeting causes me to feel that it might be equally hard to get them to the train.

JAMES A. FAIRLEIGH, M. Am. Soc. C. E.—I can state positively that the train will move promptly at 9.30 A. M.

MAJOR JENKINS.—The members might start at 9.15, so as to be in time for the 9.30 train.

MR. FAIRLEIGH.—The train leaves from the Union Depot, and not the Terminal.

MAJOR JENKINS.—Yes, opposite the Read House, on Ninth Street.

THE SECRETARY.—At 8.30 P. M., in this hall, there will be an ad-

dress with lantern-slide views of the Lock and Dam by George F. Rowell, M. Am. Soc. C. E., and I think it will be desirable for all members to hear this description, and thus secure advance information as to what is going on at the Lock and Dam, and thus prepare themselves to enjoy more fully the interesting work that they are to see to-morrow.

MR. FAIRLEIGH.—I would like to add a few details about the trip to the Mountain this afternoon. The trip was conceived, and is being executed primarily, for the benefit of the ladies of the party, by the ladies of the local committee. Therefore, I hope that all the ladies who are here will avail themselves of this opportunity. The local ladies will prepare lunches—a basket picnic, I believe they call it—and it will be served at the New York Monument. All that is necessary is to walk toward the Point and you will soon come to the New York Monument.

A MEMBER.—Point of the park?

MR. FAIRLEIGH.—The Point Park, where the New York Monument is located; directly north from the Incline station. The cost of the trip will be paid by the persons who go; it will be approximately 60 cents; 10 cents on the railroad and 50 cents on the incline at the Mountain. I want to impress on the members that the ladies will be disappointed—the committee will be disappointed—if all the ladies do not attend, and I trust that as many members as possible will go along.

A MEMBER.—Is that a special rate on the Incline Railway?

MR. FAIRLEIGH.—The rate, as I understand it, will be 50 cents for the round trip. The luncheon will be served at about six o'clock, after the party has had a chance to walk around and view the scenery; after that the return will be made to the hotel in time for the address on the Lock and Dam by Mr. Rowell.

I think that Lookout Mountain is one of the important points of interest around Chattanooga, and that every member who has not been there should certainly make an effort to go. If you leave Chattanooga without seeing it, you will have missed one of the prettiest views of this city, and I simply want to urge on all to attend if possible.

THE SECRETARY.—Mr. President, I have been requested by the Secretary of the Nominating Committee to state that that committee will meet this evening in this house at eight o'clock. A room will be provided, and the members of the committee will make inquiry at the desk and be told where the room is located.

MR. FAIRLEIGH.—I neglected to state that we will leave the hotel at 3.30 o'clock this afternoon.

THE SECRETARY.—I think we had better fix that time. If we want to catch the cars at 3.30, we must leave the hotel at 3.15.

MAJOR JENKINS.—I understand, then, Mr. Fairleigh, it is definitely

Announcements
(continued).

fixed that the cars will be at Ninth and Market Streets. You can get on either of two lines, the Alton Park line or to go to Ninth and Market Streets and take the Lookout Mountain car. The Alton Park line passes right in front of the hotel here. Either line goes directly to the incline.

You will find that information written out at the desk of the Secretary's assistant. You will remember that the basket picnic will begin at six o'clock.

THE PRESIDENT.—Has any member any business to put before this meeting?

THE SECRETARY.—Will you announce, Mr. President, the meeting of the Board of Direction?

THE PRESIDENT.—There will be a meeting of the Board of Direction immediately after the adjournment of this meeting, and I will ask the members of the Board to meet at once.

(There being no further business to be brought before the Society the meeting was adjourned.)

FORTY-THIRD ANNUAL CONVENTION**EXCURSIONS AND ENTERTAINMENTS**

The arrangements for the Convention were in the hands of the following Committees:

Committee of Arrangements of the Board of Direction

HUNTER McDONALD, *Chairman*;

WILLIAM E. BELKNAP,

CHAS. WARREN HUNT.

Local Committee

WILLIAM DUNBAR JENKINS, *Chairman*;

E. E. BETTS,

W. M. GARDNER,

H. S. BOSLER,

W. H. COURTENAY,

W. H. CONVERSE,

J. W. KENDRICK,

J. A. FAIRLEIGH,

J. N. HAZLEHURST,

C. H. FISK,

T. G. DABNEY,

D. H. WOOD,

W. S. LEE,

W. W. HARTS,

J. E. SIRRINE,

W. W. CARSON,

GEORGE E. ROWELL,

W. F. REICHARDT.

Informal Reception

Monday, June 12th, 1911.—During the evening an informal reception was held at the Hotel Patten, which was largely attended by members and guests.

Excursion to Fort Oglethorpe

Tuesday, June 13th, 1911.—There was an excursion to Fort Oglethorpe by trolley; thence, by tally-ho coaches and stages, the party was driven through Chickamauga Battle Fields Park, and, *via* the Crest Road on Missionary Ridge, back to Chattanooga.

Picnic on Lookout Mountain

Wednesday, June 14th, 1911.—By invitation of the ladies of the Local Committee the entire party was invited to a basket picnic on Lookout Mountain. This was a delightful affair, and was very largely attended.

Excursion to Hale's Bar

Thursday, June 15th, 1911.—Owing to low water in the Tennessee River, it was not possible to go down the river by steamer, as originally intended, and the party was therefore taken by special train, by courtesy of the Louisiana, Chattanooga and St. Louis Railway, to Hale's Bar, where the hydro-electric development construction works

of the Chattanooga and Tennessee River Power Company were inspected. Through the courtesy of Messrs. Jacobs and Davies, Inc., Constructing and Consulting Engineers on this work, the large party was entertained at luncheon, and the return to Chattanooga was made by special train over the L., C. & St. L. Ry., which was stopped *en route* to examine specially interesting points of railroad construction, notably the elimination of the Summit Tunnel, which is now in progress.

In the evening there was a well attended and enjoyable Reception with dancing at the Hotel Patten.

Excursion to the Chattanooga Water-Works, etc.

Friday, June 16th, 1911.—A special excursion to the water-works plant, L. H. Bixby, General Manager, and to other works of interest was made, and in the afternoon the entire party met at the Chattanooga Golf and Country Club where, by courtesy of the Club, a number of members and guests enjoyed a golf tournament for which four prizes had been furnished by the Local Committee.

During the entire Convention, facilities for visits to the many interesting historical and scenic points about Chattanooga, as well as to many of the industrial and manufacturing plants, were furnished by the Local Committee.

Attendance

The following 87 Members were in attendance. There were also present 124 ladies and others of the families of members.

Aiken, W. A..	Philadelphia, Pa.	Connor, E. H.,	
Alsberg, Julius.	New York City		Leavenworth, Kans.
Andrews, D. M.....	Rome, Ga.	Connor, W. D.,	
Auryansen, F....	Jamaica, N. Y.		Washington, D. C.
Ayres, W. E.....	Memphis, Tenn.	Converse, W. H.,	
			Chattanooga, Tenn.
Baldwin, A. S.....	Chicago, Ill.	Cotton, J. P.....	Newport, R. I.
Bates, Onward	Chicago, Ill.	Coulson, Ben L..	Sewanee, Tenn.
Belknap, W. E...	New York City	Courtenay, W. H.,	
Bensel, J. A.....	Albany, N. Y.		Louisville, Ky.
Betts, E. E..	Chattanooga, Tenn.		
Bogart, John...	New York City	Dabney, A. L..	Clarksdale, Miss.
Bosler, H. S.,		De Berard, W. W...	Chicago, Ill.
	Chattanooga, Tenn.		
Bright, C. E.....	Riverton, Ala.	Endicott, M. T.,	
			Washington, D. C.
Carson, W. W..	Knoxville, Tenn.		
Clarke, G. C...	New York City	Fain, J. R....	Harriman, Tenn.
Class, C. F.....	Camden, N. J.	Fairleigh, J. A.,	
Coleman, J. F..	New Orleans, La.		Chattanooga, Tenn.

Fay, F. H.....Boston, Mass.
 Forgie, James..New York City
 Fuqua, P. D.....Rome, Ga.

Giddings, Frederick,
 Atchison, Kans.
 Greiner, J. E....Baltimore, Md.

Hansen, Paul,
 Bowling Green, Ky.
 Harlow, J. H...Darlington, Md.
 Harts, W. W...Nashville, Tenn.
 Haugh, J. C...New Orleans, La.
 Hazlehurst, J. N...Atlanta, Ga.
 Hovey, O. E....New York City
 Howard, E. E...Kansas City, Mo.
 Howe, H. N....Memphis, Tenn.
 Howie, H. B. W.,
 Chattanooga, Tenn.
 Hunt, Chas. Warren,
 New York City

Jenkins, W. D.,
 Chattanooga, Tenn.
 Johnson, T. H....Pittsburg, Pa.
 Jones, H. M....Nashville, Tenn.
 Juengst, H. F....Pittsburg, Pa.

Kellogg, N. B.,
 San Francisco, Cal.
 King, P. S....Philadelphia, Pa.
 Kinney, W. M....Pittsburg, Pa.

Leffler, B. R....Cleveland, Ohio
 Lewis, E. C....Nashville, Tenn.
 Lewis, F. H...Birmingham, Ala.
 Lindsey, Kieffer.....Rome, Ga.
 Little, G. K....Tuscaloosa, Ala.
 Lysterly, C. A., Jr.,
 Chattanooga, Tenn.
 Lynch, M. L....Jackson, Miss.

McDonald, Hunter,
 Nashville, Tenn.

McLure, N. R....St. Louis, Mo.
 Meem, J. C....Brooklyn, N. Y.
 Miller, C. H....St. Louis, Mo.
 Mitcham, G. N....Auburn, Ala.
 Montfort, Richard,
 Louisville, Ky.
 Moorshead, T. C.....Alton, Ill.

Norcross, P. H....Atlanta, Ga.

Olney, A. C...Birmingham, Ala.

Patton, W. B....Duluth, Minn.
 Pew, Arthur.....Atlanta, Ga.
 Pickett, W. D....Lexington, Ky.

Ridgway, Robert,
 Poughkeepsie, N. Y.
 Rowell, G. F.....Guild, Tenn.

Schneider, C. C.,
 Philadelphia, Pa.
 Schulz, W. F....Memphis, Tenn.
 Solomon, G. R....Atlanta, Ga.
 Spencer, Herbert..New York City

Thomas, R. D.,
 Minneapolis, Minn.
 Tilden, C. J....Ann Arbor, Mich.
 Todd, A. M....Vicksburg, Miss.

Van Cleve, A. H.,
 New York City

Wall, Edward E..St. Louis, Mo.
 Warner, J. E.....Benton, Mo.
 West, C. H....Greenville, Miss.
 Wingfield, Nisbet..Augusta, Ga.
 Wood, D. H...Chattanooga, Tenn.
 Worcester, J. R...Boston, Mass.

Yappen, A.....Chicago, Ill.
 Young, O. E.....Lincoln, Ala.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

October 4th, 1911.—8.30 P. M.—This will be a regular business meeting. A paper by Wilson Sherman Kinnear, M. Am. Soc. C. E., entitled "The Detroit River Tunnel," will be presented for discussion.

This paper was printed in *Proceedings* for August, 1911.

October 18th, 1911.—8.30 P. M.—At this meeting a paper by George Gibbs, M. Am. Soc. C. E., entitled "The New York Tunnel Extension of the Pennsylvania Railroad: Station Construction, Road, Track, Yard Equipment, Electric Traction, and Locomotives," will be presented for discussion.

This paper was printed in *Proceedings* for May, 1911.

November 1st, 1911.—8.30 P. M.—A regular business meeting will be held and two papers will be presented for discussion, as follows: "Some of the Properties of Oil-Mixed Portland Cement Mortar," by Logan Waller Page, M. Am. Soc. C. E., and "Reinforced Concrete Bridge Across the Almendares River, Havana, Cuba," by Eugene Klapp and W. J. Douglas, Members, Am. Soc. C. E.

These papers are printed in this number of *Proceedings*.

November 15th, 1911.—8.30 P. M.—A paper by W. W. Clifford, Jun. Am. Soc. C. E., entitled "A Reinforced Concrete Stand-Pipe," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members, who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general

books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which, from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest

**Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

of the Association at any of the above meetings, if he will notify the Secretary that he is in San Francisco.

(Abstract of Minutes of Meeting)

June 16th, 1911.—The meeting was called to order; President Derleth in the chair; E. T. Thurston, Jr., Secretary; and present, also, 54 members and guests.

President Derleth reported that the committee of three appointed to consider the question of securing engineering representation in connection with the Panama-Pacific Exposition, had communicated with the American Society of Civil Engineers and had received a reply from Chas. Warren Hunt, Secretary, stating that the question had been referred to a special committee of three, to be appointed by the President of the Society, with instructions to report back to the Board of Direction as soon as possible. President Derleth also made a brief report in regard to the work of the Committees in connection with the selection of a site for the Exposition.

Announcements were made by Messrs. Wagoner and Derleth relative to the proposed amalgamation of the local engineering societies.

A paper giving a detailed description of the engineering features in connection with the design of the South San Joaquin Irrigation System, was read by Edwin Duryea, Jr., M. Am. Soc. C. E., who illustrated his remarks with stereopticon views, and the subject was discussed by the members present.

Adjourned.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Gavin N. Houston, M. Am. Soc. C. E., 409 Equitable Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and until further notice, will take place at The Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

**PRIVILEGES OF ENGINEERING SOCIETIES
EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all Meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street,
New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66,
Germany.

- Associação dos Engenheiros Cívis Portuguezes**, Lisbon, Portugal.
- Australasian Institute of Mining Engineers**, Melbourne, Victoria, Australia.
- Boston Society of Civil Engineers**, 715 Tremont Temple, Boston, Mass.
- Brooklyn Engineers' Club**, 117 Remsen Street, Brooklyn, N. Y.
- Canadian Society of Civil Engineers**, 413 Dorchester Street, West, Montreal, Que., Canada.
- Civil Engineers' Society of St. Paul**, St. Paul, Minn.
- Cleveland Engineering Society**, Chamber of Commerce Building, Cleveland, Ohio.
- Cleveland Institute of Engineers**, Middlesbrough, England.
- Dansk Ingeniorforening**, Amaliegade 38, Copenhagen, Denmark.
- Engineers' and Architects' Club of Louisville, Ky.**, 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.
- Engineers' Club of Baltimore**, Baltimore, Md.
- Engineers' Club of Minneapolis**, 17 South Sixth Street, Minneapolis, Minn.
- Engineers' Club of Philadelphia**, 1317 Spruce Street, Philadelphia, Pa.
- Engineers' Club of St. Louis**, 3817 Olive Street, St. Louis, Mo.
- Engineers' Club of Toronto**, 96 King Street, West, Toronto, Ont., Canada.
- Engineers' Society of Northeastern Pennsylvania**, 302 Board of Trade Building, Scranton, Pa.
- Engineers' Society of Pennsylvania**, 219 Market Street, Harrisburg, Pa.
- Engineers' Society of Western Pennsylvania**, 2511 Oliver Building, Pittsburg, Pa.
- Institute of Marine Engineers**, 58 Romford Road, Stratford, London, E., England.
- Institution of Engineers of the River Plate**, Buenos Aires, Argentine Republic.
- Institute of Naval Architects**, 5 Adelphi Terrace, London, W. C., England.
- Junior Institution of Engineers**, 39 Victoria Street, Westminster, S. W., London, England.
- Koninklijk Instituut van Ingenieurs**, The Hague, The Netherlands.
- Louisiana Engineering Society**, 321 Hibernia Bank Building, New Orleans, La.
- Memphis Engineering Society**, Memphis, Tenn.
- Midland Institute of Mining, Civil and Mechanical Engineers**, Sheffield, England.
- Montana Society of Engineers**, Butte, Montana.

North of England Institute of Mining and Mechanical Engineers,
Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschen-
bachgasse 9, Vienna, Austria.

Pacific Northwest Society of Engineers, 803 Central Building, Seat-
tle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachslicher Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris,
France.

Society of Engineers, 17 Victoria Street, Westminster, S. W.,
London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm,
Sweden.

Tekniske Forening, Vestre Boulevard 18-1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From August 2d to September 12th, 1911)

DONATIONS *

GOVERNMENT OWNERSHIP OF RAILWAYS

Considered as the Next Great Step in American Progress. By Anthony Van Wagenen. Cloth, $7\frac{1}{2} \times 5\frac{1}{4}$ in., 9 + 256 pp. New York and London, G. P. Putnam's Sons, 1910. \$1.25.

The author states that this book is a plain history of the growth of public ownership from the time the Belgian Government began the building of railroads to the present day, and that it is written for the general reader. Few tables or statistics are given, and the author hopes that the book will stimulate public discussion of the subject. The Chapter headings are: Introduction; Ownership and Operation of Railways a Legitimate Function of Government; Weakness of Private Management; The Principle of Freight Rate-Making, Known as "Charging What the Traffic will Bear"; Will the Government be as Enterprising as Private Corporations Have Been in Extending the Service of the Railways; What Successful Government Control Would Mean; Government Ownership and Federal Patronage; Is Government Ownership Socialism; Government Ownership and States' Rights; How Government Ownership Affects the Laboring Man; The Mortality of Private Ownership; Freight Rates Under Government Ownership; Are Freight Rates Higher Under Government Ownership; Tapering Rates; The Unsoundness of Some of the Arguments Against Government Ownership; Railway Consolidation; The Source of Railway Political Power; Is Government Ownership Satisfactory Where It Has Been Tried; No Danger of Bankruptcy in Owning the Railroads; The Real Danger of Bankruptcy; Our Great Mileage and the Corresponding Magnitude of the Deal; Progress and Chronology of Government Ownership; Procrastination; Need of Immediate Action; Index.

THE TESTING OF ENGINES, BOILERS, AND AUXILIARY MACHINERY.

A Treatise on the Construction and Use of the Instruments and Methods Employed in the Testing of Prime Movers in the Laboratory and Workshop. By W. W. F. Pullen. Second Edition. Cloth, 9 x 6 in., illus., 730 pp. Manchester, England, The Scientific Publishing Company, 1911. 12 shillings 6 pence.

The first edition of this work was published in 1900 under the title "Experimental Engineering." For this, the second edition, it is stated, that the subject-matter has been re-written and many new illustrations have been added representing the latest and most useful apparatus. The author states that the object of the book is to place before engineers and students a detailed account of some of the methods of carrying out experiments on engines, boilers, and their auxiliary machinery, together with a description of the apparatus used. The first chapters are devoted to explanations of the theoretical work on which calculating and averaging instruments are based, in order to instruct the operator as to their principles. These are followed by a review of the necessary instruments used in the chief experiments and the directions in which they may be misused and misapplied. The book concludes with a description of the installations and a few experiments which may be made on motive-power machinery. The Contents are: Tables and Other Data; Mechanical Aids to Calculation; Measurement of Pressure; Measurement of Temperature; Measurement of Speed; Measurement of Power Output; Measurement of Power Input with Dynamometer; Measurement of Power Input with Indicator; Indicator Rigs and Accessories; Hints on the Management of Indicators; Analysis of the Steam Engine Diagram; Other Features of Steam Engine Diagrams; The Adjustment of the Slide Valve; Internal-Combustion Engine Diagrams; Testing Indicator Springs; Measurement of the Quality of Steam; Measurement of Quantity of Steam and Water; The Testing of Steam Engines; Fuel Testing; The Analysis of Flue Gases; Boiler Testing; The Testing of Auxiliary Machinery; The Testing of Internal Combustion Engines; Index.

A TREATISE ON THE DESIGN AND CONSTRUCTION OF MILL BUILDINGS

And Other Industrial Plants. By Henry Grattan Tyrrell. Cloth, $9\frac{1}{4} \times 6\frac{1}{4}$ in., illus., 15 + 490 pp. Chicago and New York, The Myron C. Clark Publishing Co.; London, E. & F. N. Spon, Ltd., 1911. \$4.00.

This work is stated to be the outcome of the author's "Mill Building Construction," published in 1900. Both books are based, it is said, on personal ex-

* Unless otherwise specified, books in this list have been donated by the publishers.

periences in designing and estimating buildings, bridges, and other structural work, covering a period of twenty years. In Part I, Theory of Economic Design, the author considers the general features of a building, including its size, shape, dimensions, arrangement and location of machinery, roof covering, draining, lighting, ventilation, etc. A table of required wall thicknesses according to the building laws of various cities, is given, together with comparative estimated costs of different kinds of manufacturing buildings. In Part II, Loads, the dead and live loads are stated to be considered in detail, tables of weights being also included. In Part III, Framing, the chapters on Wood Framing and Concrete Framing are short and consist chiefly of illustrations, these subjects, it is stated, being discussed in detail in various recent treatises. This part includes chapters on Steel Framing and Northern Light Roof Framing, in which these subjects are discussed in detail. The author states that he has purposely omitted chapters on Graphic Statics and Calculations, which are fully treated in other books. In Part IV, Details of Construction, the chapter on Ground Floors, which the author states is important and about which there is little available literature, is well illustrated. Part IV also contains several chapters on paints and painting for the preservation of materials in modern manufacturing plants. Part V, Engineering and Drafting Departments of Structural Works, which is stated to have been prepared especially for students, estimators, and draftsmen, includes chapters on the organization and office methods of these departments, and the estimation of quantities and costs, including a table of wages paid to mechanics in the building trades in various cities of the United States in 1910, and also a chapter on Directions for Exporting Steel Buildings.

THE PUBLIC HEALTH MOVEMENT.

The Annals of the American Academy of Political and Social Science, Vol. XXXVII, No. 2, March, 1911. Emory R. Johnson, Editor. Paper, 10 x 7 in., 334 pp. Philadelphia, American Academy of Political and Social Science, 1911. \$1.00.

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JUNIORS

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 Dike, Thistle, Utah.
 WRIGHT, THOMAS JUDSON, JR. 212 Trust Bldg., Charlotte, N. C.

RESIGNATIONS

ASSOCIATE MEMBERS

	Date of Resignation.
MACKENZIE, GEORGE BURDICK.....	Sept. 5, 1911
MUNN, MORTIMER ADAM.....	Sept. 5, 1911

DEATHS

CHRISTIE, JAMES. Elected Member May 7th, 1873; died August 24th, 1911.

COLLINGWOOD, FRANCIS. Elected Member March 3d, 1869; died August 18th, 1911.

FRAZER, JOSEPH HECKART. Elected Junior March 31st, 1908; date of death unknown.

HAZEN, RICHARD. Elected Junior, November 8th, 1909; died August 13th, 1911.

PIERCE, HENRY. Elected Member December 5th, 1894; died August 21st, 1911.

TAYLOR, WILLIAM DANA. Elected Member March 1st, 1899; died August 26th, 1911.

**Total Membership of the Society, September 12th, 1911,
6 159.**

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(August 8th to September 9th, 1911)

NOTE.—This list is published for the purpose of placing before the members of the Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- (1) *Journal*, Assoc. Eng. Soc., 31 Milk St., Boston, Mass., 30c.
- (2) *Proceedings*, Engrs. Club of Phila., 1317 Spruce St., Philadelphia, Pa.
- (3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
- (4) *Journal*, Western Soc. of Engrs., Monadnock Bldg., Chicago, Ill.
- (5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
- (6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
- (8) *Stevens Institute Indicator*, Stevens Inst., Hoboken, N. J., 50c.
- (9) *Engineering Magazine*, New York City, 25c.
- (10) *Cassier's Magazine*, New York City, 25c.
- (11) *Engineering* (London), W. H. Wiley, New York City, 25c.
- (12) *The Engineer* (London), International News Co., New York City, 35c.
- (13) *Engineering News*, New York City, 15c.
- (14) *The Engineering Record*, New York City, 12c.
- (15) *Railway Age Gazette*, New York City, 15c.
- (16) *Engineering and Mining Journal*, New York City, 15c.
- (17) *Electric Railway Journal*, New York City, 10c.
- (18) *Railway and Engineering Review*, Chicago, Ill., 10c.
- (19) *Scientific American Supplement*, New York City, 10c.
- (20) *Iron Age*, New York City, 10c.
- (21) *Railway Engineer*, London, England, 25c.
- (22) *Iron and Coal Trades Review*, London, England, 25c.
- (23) *Bulletin*, American Iron and Steel Assoc., Philadelphia, Pa.
- (24) *American Gas Light Journal*, New York City, 10c.
- (25) *American Engineer*, New York City, 20c.
- (26) *Electrical Review*, London, England.
- (27) *Electrical World*, New York City, 10c.
- (28) *Journal*, New England Water-Works Assoc., Boston, Mass., \$1.
- (29) *Journal*, Royal Society of Arts, London, England, 15c.
- (30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium.
- (31) *Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand*, Brussels, Belgium.
- (32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
- (33) *Le Génie Civil*, Paris, France.
- (34) *Portefeuille Economiques des Machines*, Paris, France.
- (35) *Nouvelles Annales de la Construction*, Paris, France.
- (37) *Revue de Mécanique*, Paris, France.
- (38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
- (41) *Modern Machinery*, Chicago, Ill., 10c.
- (42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, 50c.
- (43) *Annales des Ponts et Chaussées*, Paris, France.
- (44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
- (45) *Mines and Minerals*, Scranton, Pa., 20c.
- (46) *Scientific American*, New York City, 8c.
- (47) *Mechanical Engineer*, Manchester, England.
- (48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany.
- (49) *Zeitschrift für Bauwesen*, Berlin, Germany.
- (50) *Stahl und Eisen*, Düsseldorf, Germany.
- (51) *Deutsche Bauzeitung*, Berlin, Germany.
- (52) *Rigische Industrie-Zeitung*, Riga, Russia.
- (53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria.
- (54) *Transactions*, Am. Soc. C. E., New York City, \$4.
- (55) *Transactions*, Am. Soc. M. E., New York City, \$10.
- (56) *Transactions*, Am. Inst. Min. Engrs., New York City, \$5.
- (57) *Colliery Guardian*, London, England.

- (58) *Proceedings*, Engrs.' Soc. W. Pa., 803 Fulton Bldg., Pittsburg, Pa., 50c.
- (59) *Transactions*, Mining Inst. of Scotland, London and Newcastle-upon-Tyne, England.
- (60) *Municipal Engineering*, Indianapolis, Ind., 25c.
- (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
- (62) *Industrial World*, 59 Ninth St., Pittsburg, Pa.
- (63) *Minutes of Proceedings*, Inst. C. E., London, England.
- (64) *Power*, New York City, 20c.
- (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
- (66) *Journal of Gas Lighting*, London, England, 15c.
- (67) *Cement and Engineering News*, Chicago, Ill., 25c.
- (68) *Mining Journal*, London, England.
- (70) *Engineering Review*, New York City, 10c.
- (71) *Journal*, Iron and Steel Inst., London, England.
- (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
- (73) *Electrician*, London, England, 18c.
- (74) *Transactions*, Inst. of Min. and Metal., London, England.
- (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
- (76) *Brick*, Chicago, Ill., 10c.
- (77) *Journal*, Inst. Elec. Engrs., London, England.
- (78) *Beton und Eisen*, Vienna, Austria.
- (79) *Forschungsarbeiten*, Vienna, Austria.
- (80) *Tonindustrie Zeitung*, Berlin, Germany.
- (81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
- (83) *Progressive Age*, New York City, 15c.
- (84) *Le Ciment*, Paris, France.
- (85) *Proceedings* Am. Ry. Eng. and M. of W. Assoc., Chicago, Ill.
- (86) *Engineering-Contracting*, Chicago, Ill., 10c.
- (87) *Roadmaster and Foreman*, Chicago, Ill., 10c.
- (88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
- (89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa.
- (90) *Transactions*, Inst. of Naval Archts., London, England.
- (91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
- (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
- (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
- (94) *The Boiler Maker*, New York City, 10c.
- (95) *International Marine Engineering*, New York City, 20c.
- (96) *Canadian Engineer*, Toronto, Ont., Canada, 15c.
- (97) *Turbine*, Berlin, Germany, 1 Mark.
- (98) *Journal*, Engrs. Soc. Pa., 219 Market St., Harrisburg, Pa., 30c.
- (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$1.50.
- (100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., \$1.
- (101) *Metal Worker*, New York City, 10c.
- (102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
- (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
- (104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
- (105) *Metallurgical and Chemical Engineering*, New York City, 25c.
- (106) *Transactions*, Inst. of Mining Engrs., London, England, 6 shillings.
- (107) *Schweizerische Bauzeitung*, Zurich, Switzerland.
- (108) *Southern Machinery*, Atlanta, Ga., 10c.

LIST OF ARTICLES.

Bridges.

- The Pittsburg and Lake Erie Railroad Cantilever Bridge Over the Ohio River at Beaver, Pa.* Albert R. Raymer, M. Am. Soc. C. E. (54) Vol. 73.
- The Necessity of Steel Highway Bridge Inspection, Investigation and Maintenance. N. B. Carver. (From the *Iowa Engineer*.) (96) Aug. 3.
- The Old Essex-Merrimac Chain Suspension Bridge at Newburyport, Mass., and Tests of Its Wrought-Iron Links After 100 Years' Service.* A. P. Mills. (Abstract from *Cornell Civil Engr.*) (13) Aug. 3.
- Substructure of the Kentucky and Indiana Bridge.* (15) Aug. 4.
- Schemes of Erection Proposed for the Quebec Bridge.* (13) Aug. 10.
- Erection of Opossum Creek and Beaver Creek Viaducts.* (14) Aug. 12.
- Quebec Bridge Caissons.* (14) Aug. 12; (12) Aug. 18.
- The Construction of the Kuskulana River Bridge, Alaska.* A. C. O'Neel. (14) Aug. 12.
- The Erection of the Naugatuck Bridge.* (14) Aug. 19.
- The Architectural Features of St. Paul's Bridge. (14) Aug. 19.
- A Double-Track Skew Bridge with Solid Floor.* (14) Aug. 19.
- American Practice in General Type and Clearance of Bridges in Grade Separation Work. Robert H. Whitman. (86) Aug. 23.

*Illustrated.

Bridges—(Continued).

- A Highway and Electric Car Crossing over Railroad Tracks.* (14) Aug. 26.
Standard Plans and Specifications for Timber Trestles, Seattle, Wash.* R. H. Thomson. (86) Aug. 30.
The Crossing of the Western Maryland R. R. over the Pennsylvania R. R. near Connelville, Pa.* (13) Aug. 31.
Pont en Béton Armé Construit sur la Meuse à Hermalle sous Huy.* C. Houart. (30) Aug.
Le Pont en Béton Armé, en Bow-String, de Montesquieu (Haute-Garonne).* Alfred Jacobson. (33) Aug. 5.
Bogen mit starkem Schub.* Adolf Francke. (81) Pt. 5.
Die Blackwells-Insel Brücke über den Ost-Fluss in Newyork.* G. Barkhausen. (48) Serial beginning July 29.
Last (Raddruck-) verteilung bei Fahrbahntafeln aus Eisenbeton und die Vorschriften für Oesterreich.* M. Gatterer. (78) Aug. 4.
Versuche mit Druckstäben aus Nickelstahl.* F. Bohny. (50) Aug. 10.
Strassenbrücke über den neuen Kieler Güterbahnhof.* Viktor Mautner. (78) Serial beginning Aug. 24.
Die Brücke der "Wiedergeburt" über den Tiber in Rom (100 m Spannweite).* Theodor Gesteschl. (78) Serial beginning Aug. 24.
Der Wettbewerb um den Entwurf einer Strassenbrücke über den Rhein bei Köln.* Karl Bernhard. (48) Aug. 26.

Electrical.

- Electricity Meters, with Notes on Meter Testing.* H. A. Ratcliff and A. E. Moore. (77) July.
Wireless Telegraphy in Relation to Interferences and Perturbations.* J. E. Taylor. (77) July.
The Electrical Undertaking of the Birmingham Tame and Rea District Drainage Board.* L. F. Mountfort. (77) July.
Electric Heating as Applied to Cooking Apparatus. Harold Gray. (77) July.
Some Considerations Relating to the Parallel Working of Alternators.* James R. Barr. (77) July.
Vibrating Wires and the Measurement of Distance.* C. A. Smith, A. Am. I. Elec. E. (26) July 28.
Some Protective Relays for Alternating-Current Circuits.* Kenelm Edgcumbe. (26) Serial beginning July 28.
The Electrical Equipment of the S. S. *Olympic* and *Titanic*.* (73) Serial beginning July 28.
Apparatus for Charging Storage Batteries.* H. K. Ferguson, R. E. Russell and E. E. Kimball. (87) Aug.
Transmission System of the Central Colorado Power Co.* P. T. Hanscom. (42) Aug.
Problems in Telephone Traffic Engineering.* F. P. Valentine. (42) Aug.
Balancing the Rotors of Turbo-Generators.* J. W. Rogers. (10) Aug.
Main Substation of the Metropolitan Electric Company at Reading, Pa.* (27) Aug. 5; (64) Aug. 15.
Application of Motor Drive to Brick Plants.* Gordon Weaver. (27) Aug. 5.
"By-Product" Electric-Light Plants.* George H. Morse. (Paper read before the Nebraska Elec. Assoc.) (27) Aug. 5.
Electric Lighting from Three-Phase Circuits.* G. P. Hoxie. (27) Aug. 5.
Extension of Redondo Beach Plant.* A. R. Maujer. (64) Aug. 8.
Electricity Supply at Marseilles.* (73) Aug. 11.
Hydroelectric Development in Northern Ontario.* (27) Aug. 12.
Regenerative Control from a Commercial Viewpoint.* Gustaf V. Lang. (27) Aug. 12.
The Manufacture of Drawn Tungsten Filament Lamps.* (11) Aug. 18.
Dubilier Wireless Telegraph Station at Seattle.* (73) Aug. 18.
The Power Required to Cut Steel. P. V. Vernon. (12) Aug. 18.
New Type of Storage Battery Car.* (17) Aug. 19.
Modern English Power Plant.* (64) Aug. 22.
The B. T.-H. Co.'s Tungsten Lamp Works.* (26) Aug. 25.
Another French Diesel Marine Motor.* (12) Aug. 25.
The Method of Constant Rate of Change of Flux as a Standard for Determining Magnetisation Curves of Iron.* J. T. Morris and T. H. Langford. (Abstract of paper read before the Physical Soc.) (73) Aug. 25.
Efficiency in the Electrolytic Production of Metallic Calcium. F. C. Frary, H. R. Bicknell and C. A. Tronson. (Abstract of paper read before the Am. Electrochemical Soc.) (73) Aug. 25.
The Electrical Precipitation of Suspended Particles.* F. G. Cottrell. (103) Serial beginning Aug. 26.
Northwestern Terminal in Chicago.* (27) Aug. 26.
The Electric vs. the Gasoline Vehicle. Hayden Eames. (27) Aug. 26.
Overhead Standardization. A. Schlessinger. (Paper read before the Central Electric Ry. Assoc.) (17) Aug. 26.

*Illustrated.



Electrical—(Continued).

- Selection of Alternating-Current Motors for Elevator Service.* A. G. Popcke. (From *Electric Journal*.) (62) Aug. 28.
 Plum Street Generating Station.* (64) Aug. 29.
 Automatic Electric Motor Control by a Novel Magnetic Switch.* (13) Aug. 31.
 Rates of the Queensborough Gas & Electric Co.; the First Commodity-Rate Case of the Public Service Commission for the First District of New York. (13) Aug. 31.
 Responsibilities of Electrical Engineers in Making Appraisals. H. M. Byllesby. (42) Sept.
 Cost of Power; Conversion Factors. Carl Hering. (105) Sept.
 The Use of Prepayment Electric Meters.* F. G. Vaughn. (3) Sept.
 The Combined Water Works, Electric Light and Ice Plant at Loveland, Ohio.* Frank C. Perkins. (60) Sept.
 The Selection of Direct-Current Motors for Factory Use. Earle D. Jackson. (9) Sept.
 The Magician Dynamo for Car Lighting.* (73) Sept. 1.
 Electrical Power Installation at the Alquife Iron Ore Mines.* (22) Sept. 1.
 Combination Heating and Generating Plant at Springfield, Ill.* (27) Sept. 2.
 Downtown Arc-Lighting System of Philadelphia.* (27) Sept. 2.
 Operation of Series Alternating-Current Street Arc Lamps.* J. C. Lawler. (27) Sept. 2.
 Southern California Edison System.* A. R. Maujer. (64) Sept. 5.
 A Swiss Transformer Station and Distributing Tower.* J. B. Van Brussel. (13) Sept. 7.
 Les Progrès de la Télégraphie Ordinaire.* Lucien Fournier. (33) Serial beginning Aug. 26.

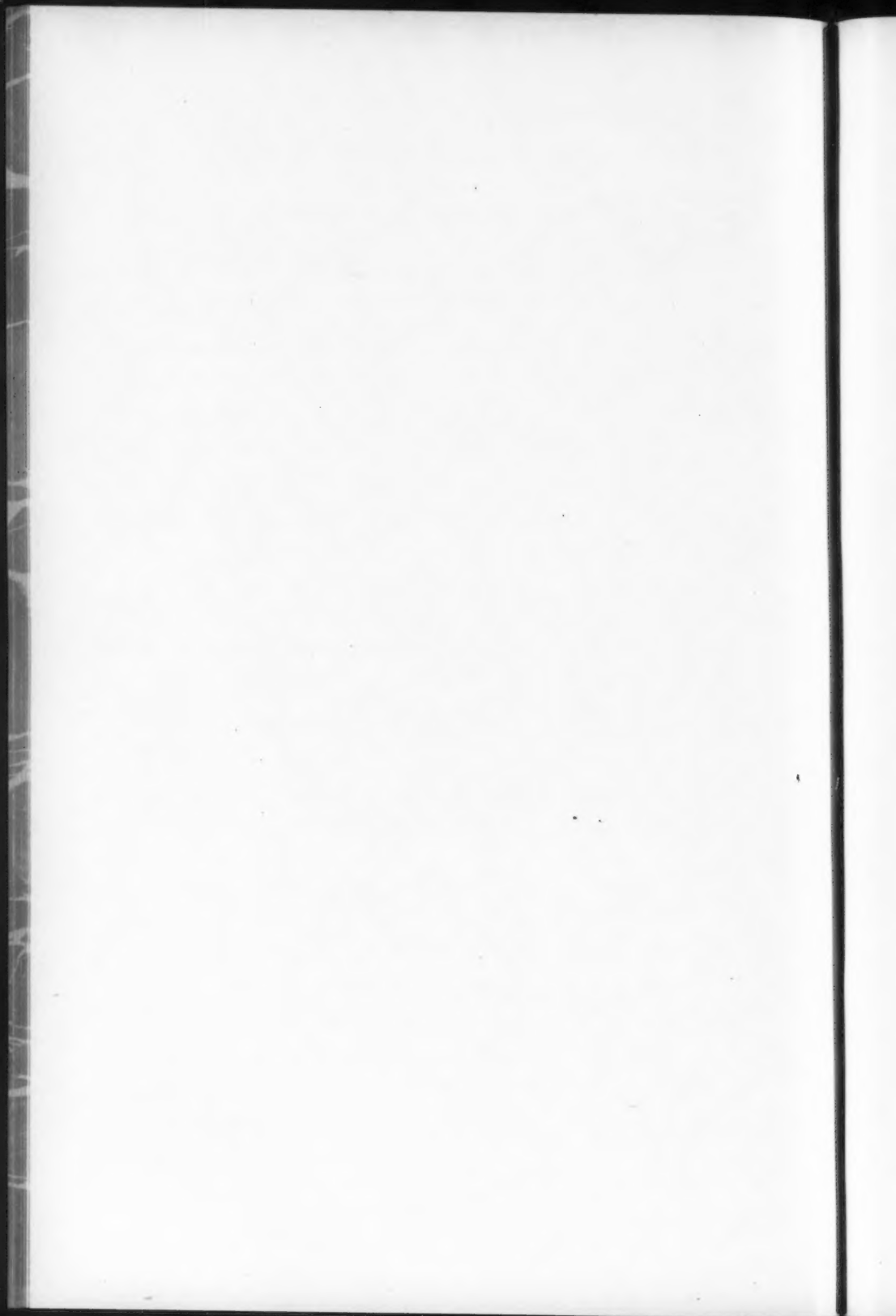
Marine.

- The Stability of Ships.* B. C. Laws. A. M. Inst. C. E. (10) Aug.
 A Floating Machine Shop and Foundry.* Paul Foley. (108) Aug.
 Anticorrosive and Antifouling Paints for Ships' Bottoms; Experience of the U. S. Navy.* Henry Williams. (Abstract from U. S. Naval Inst. *Proceedings*.) (13) Aug. 3.
 Curtis Turbines for the United States Destroyers *Sterrett* and *Perkins*. (11) Aug. 18.
 The Laubeuf Submersible Boat.* (11) Aug. 18.
 Shipbuilding Works at La Seyne.* (12) Aug. 25.
 Another French Diesel Marine Motor.* (12) Aug. 25.
 German Impulse Marine Turbines.* (12) Aug. 25.
 The Submarine Vessel.* K. Dietze. (95) Serial beginning Sept.
 A Twin Hatch Steamer with Central Deck Ballast Tank.* (95) Sept.
 The Mystery of the *Maine*.* Ludwig Diller. (46) Sept. 2; (9) Sept.; (95) Sept.
 The Rolling of Ships. J. H. Biles. (Paper read before the British Assoc. for the Advancement of Sci.) (12) Sept. 1; (11) Sept. 1.
 The New British Dreadnoughts.* (46) Sept. 9.
 Les Canots Automobiles à l'Exposition de Kiel.* T. Claes et E. Marote. (30) Aug.
 Ueber die Verkürzung der Auslaufzeit bei Kammerschleusen. Willibald Liebisch. (53) Aug. 25.

Mechanical.

- Operation of Boiler Plants of Industrial Works. John A. Hunter. (58) July.
 Inverted Incandescent Gas Lighting.* Max Scholz. (Paper read before the Gas and Electric Engrs. of the Province of Brandenburg.) (66) July 25.
 Detection of Inflammable Gas in Air. A. Philip, L. G. Steele, and Stenhouse. (Papers read before the Society of Chemical Industry.) (66) July 25.
 Propellers for Flying Machines.* Herbert Chatley. (12) July 28.
 A New Drill for Deep Holes.* George H. Gilman. (Abstract from *Mine and Quarry*.) (103) July 29.
 Some Recent Developments in Testing.* F. W. Speller. (94) Aug.
 Layout of a Hopper for a Concrete Mixer.* C. B. Lindstrom. (94) Aug.
 Some Problems of the Cement Industry. Walter S. Landis. (67) Aug.
 The Reduction of Power Losses.* Karl W. Knorr. (10) Aug.
 The Driving of Cotton Mills.* W. H. Booth. (10) Aug.
 Making Gasoline from Oil Well Gas.* F. W. Brady. (45) Aug.
 Oils for Lubrication. C. E. Ward. (Paper read before the Coal Min. Inst. of America.) (45) Aug.
 Aerial Tramways of the Balakiala Consolidated Copper Company.* William Hewitt. (10) Aug.
 Furnaces and Fuel.* Ellis Lovejoy. (76) Aug. 1.
 Bradford Pressed Brick, Economical Operation Effected by Use of Gas Engines at Two Large Plants of Bradford Pressed Brick Company.* (76) Aug. 1.

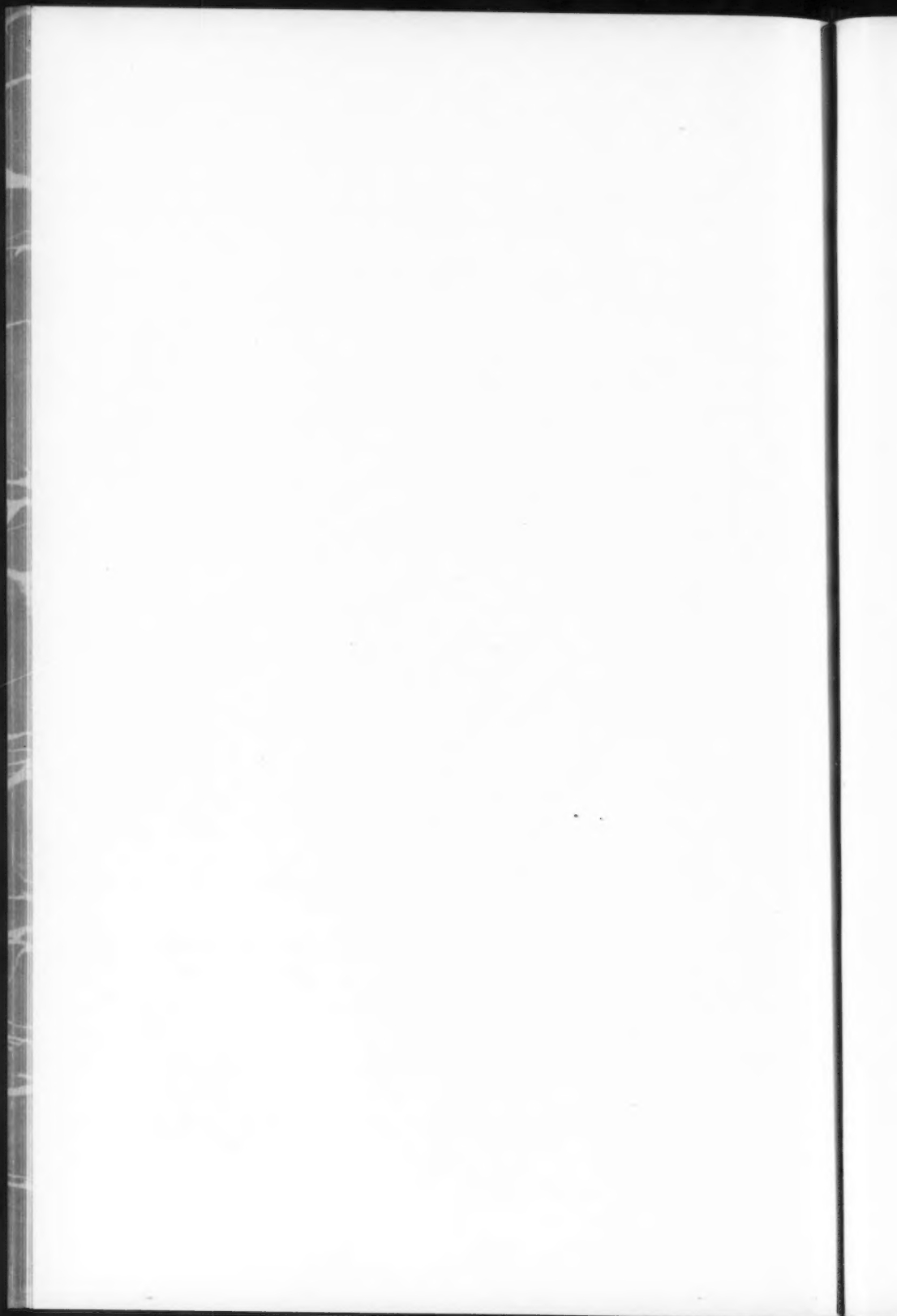
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Mechanical—(Continued).

- Corrections for the Effects of Atmospheric Conditions on Different Photometric Flame Standards.* W. J. A. Butterfield, J. S. Haldane, and A. P. Trotter. (Paper read before the International Photometric Comm.) (66) Aug. 1; (24) Sept. 4.
- Artificial Lighting of Hospitals. John Darch. (Paper read before the Royal Sanitary Inst. Congress.) (66) Aug. 1.
- The Simonds Lockport Steel Mill.* (20) Aug. 3.
- Steam Turbines.* H. Zoelly. (Paper read before the Inst. of Mech. Engrs.) (22) Aug. 4.
- The Gas Driven Electric Generating Station of the Société des Mines de Lens.* (22) Aug. 4.
- Making Dies for Forging Machines.* J. Martin. (Paper read before the Am. Railway Tool Foreman's Assoc.) (15) Aug. 4.
- Notes on Street Lighting From a Practical Point of View.* H. E. Copp. (Paper read before the Institution of Mun. and County Engrs.) (104) Serial beginning Aug. 4.
- "Soapy Water" Lubrication for Air Cylinders. J. Broad Roberts. (Abstract of paper read before the South African Inst. of Engrs.) (47) Aug. 4.
- Cement Manufacture in Germany. Otto Schott. (Abstract of paper read before the Am. Portland Cement Manufacturers.) (103) Aug. 5.
- Mail Handling Machinery at the Pennsylvania R. R. Terminal and New United States Post Office at New York City.* Julian E. Woodwell. (Abstract of paper read before the Mass. Inst. of Tech.) (18) Aug. 5.
- Gas-Producer Plant Experience at Huron, S. D.* (27) Aug. 5.
- A Grain Tester for Commercial Use.* J. W. T. Duvel. (19) Aug. 5.
- The Aviation Motor.* Earle L. Ovington. (46) Aug. 5.
- Some Unloading Costs. W. H. Matlack. (24) Aug. 7.
- Installation of Small Stationary Engines.* John S. Leese. (64) Aug. 8.
- The Berrigan Continuous Bucket-Chain Filter Press.* (13) Aug. 10.
- Conveyors for Foundries.* Henry J. Edsall. (13) Aug. 10.
- A Special Coal Handling Crane.* (20) Aug. 10.
- The Mechanical Charging of Cupolas.* G. R. Brandon. (Paper read before the Am. Foundrymen's Assoc.) (47) Aug. 11.
- Floating Jib-Crane for Spain.* (12) Aug. 11.
- Smoke Prevention in Large Power Stations. Hervey S. Vasser. (Paper read before the Internat. Assoc. for the Prevention of Smoke.) (62) Aug. 14.
- High Pressure Gas Plant with Medium Pressure on Mains.* F. H. Sawyer. (Paper read before the Southern Gas Assoc.) (24) Aug. 14.
- The Inspection of Gas Consumers and Gas Appliances. F. G. Dean. (Paper read before the Southern Gas Assoc.) (24) Aug. 14.
- The Mechanical Stoker vs. Hand Firing. Robert Cameron Beadle. (Paper read before the Internat. Assoc. for the Prevention of Smoke.) (62) Aug. 14.
- Purchasing Oil and Gas by Sample. Irving C. Allen. (83) Aug. 15.
- Developments in British Steam Plants.* James A. Seager. (64) Aug. 15.
- New Gas Works for Guadalajara, Mexico.* W. A. Aldrich. (83) Aug. 15.
- Investigation of Beloit Gas Rates. Frank A. Newton. (83) Aug. 15.
- Placing Gas in a New Factory Building.* Everett M. Hawley. (83) Aug. 15.
- The Uses of Coal Gas Appliances for Industrial Purposes. G. F. Hurst. (Paper read before the Irish Assoc. of Gas Managers.) (66) Aug. 15.
- Recent Progress in Diesel Engines.* F. E. Junge. (64) Aug. 15.
- Modern Types of Elevators.* F. E. Town. (20) Aug. 17.
- Specifications for the Purchase of Fuel Oil: U. S. Bureau of Mines. (13) Aug. 17; (18) Aug. 5; (20) Aug. 3; (101) Sept. 1; (103) Aug. 19.
- A Telferage System for Handling Baggage at an English Railway Station.* (13) Aug. 17.
- Dynamometer Tests on Broad and Narrow Tired Wagons and on Plows. William Clyde Willard. (13) Aug. 17.
- Hasleton Plant of the Republic Iron & Steel Company.* (20) Aug. 17.
- Cupola Melting Practice. P. Munnoch. (Paper read before the Am. Foundrymen's Assoc.) (47) Aug. 18.
- The Recovery of Benzol from Coke-Oven Gases.* D. C. Bagley. (22) Aug. 18.
- Ditching with the Bowman Ditcher.* T. Ahern. (15) Aug. 18.
- The Knight Valveless Engine.* F. G. Sterling. (46) Aug. 19; (13) Aug. 10.
- Smoke Prevention in New York City. Ernest J. Lederle. (Paper read before the Internat. Assoc. for the Prevention of Smoke.) (62) Aug. 21.
- Relation of Gas Producer to Smoke Problem. Robert H. Fernald. (Paper read before the Internat. Assoc. for the Prevention of Smoke.) (62) Aug. 21.
- Four Years' Experience of Vertical Retorts at Cologne. F. Leisse. (66) Aug. 22.
- Sampling and Analysis of Furnace Gas.* J. C. W. Fraser and E. J. Hoffman. (64) Aug. 22.
- Machine Versus Hand Moulding. John Alexander. (Paper read before the Am. Foundrymen's Assoc.) (47) Aug. 25.
- Coking Industry of South Yorkshire and Derbyshire. L. T. O'Shea. (Paper read before the Soc. of Chemical Industry.) (22) Aug. 25.

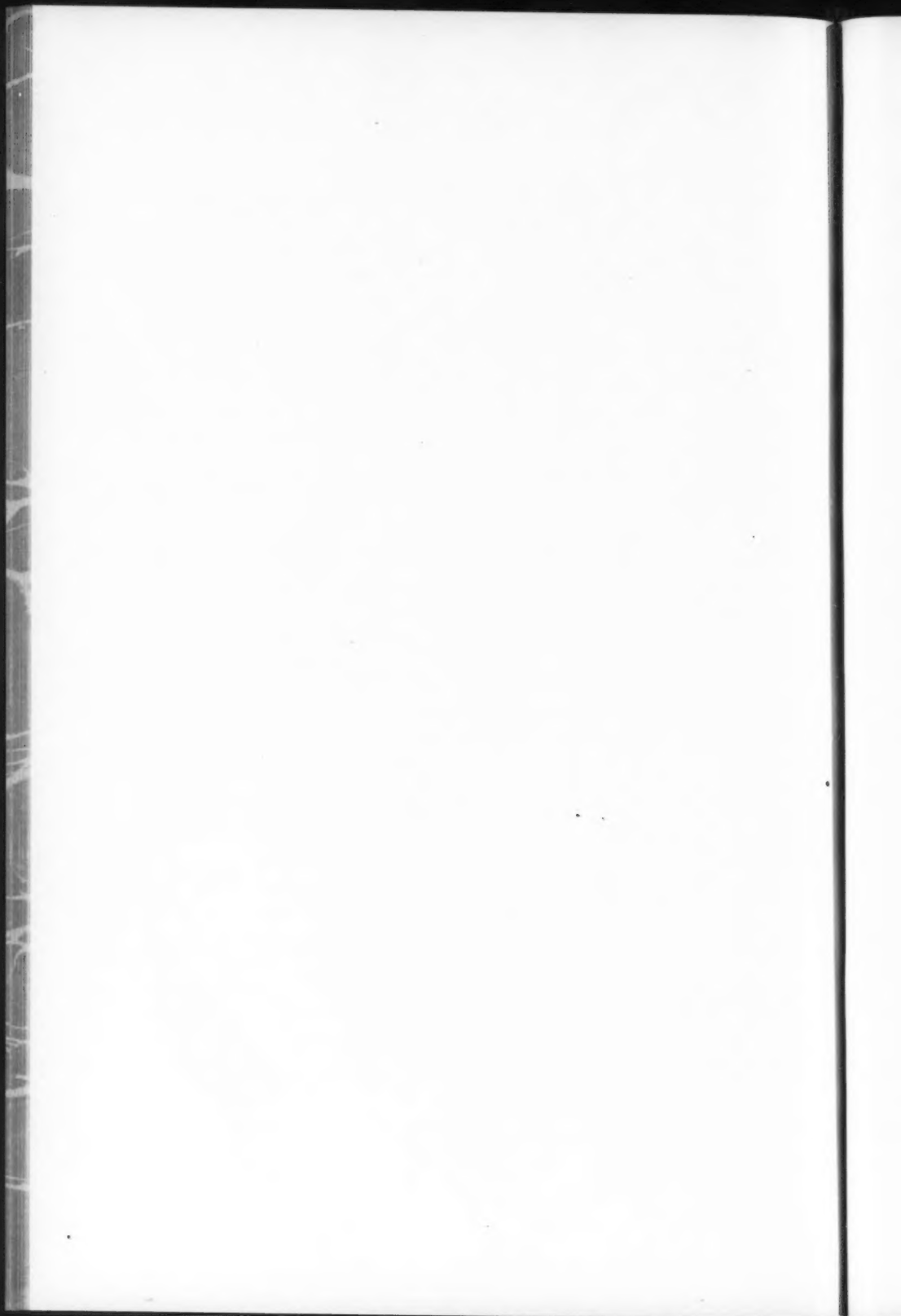
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Mechanical—(Continued).

- The Steam Turbine.* (11) Serial beginning Aug. 25.
 The Use of Petroleum as a Locomotive Fuel. Eugene McAuliffe. (Abstract of paper read before the Internat. Ry. Fuel Assoc.) (47) Aug. 25.
 Lubrication of Ball Bearings. Victor V. Page. (From *American Machinist*.) (47) Aug. 25.
 Stress in Aeroplanes in Curvilinear and Fancy Flight.* A. F. Zahm. (46) Aug. 26.
 Gasolene From Natural Gas. Frank H. Taylor. (Abstract from *Oil City Derrick*.) (62) Aug. 28.
 Low Pressure Turbines as Coal Savers. (62) Aug. 28.
 The Cost of Steam Power in Canada from Actual Performances. J. O. B. Latour. (Paper read before the Canadian Assoc. Steam E.) (96) Aug. 31.
 Rates of the Queensborough Gas & Electric Co.; the First Commodity-Rate Case of the Public Service Commission for the First District of New York. (13) Aug. 31.
 Recent Developments of the Suction Conveyor.* W. G. Hudson, M. Am. Soc. M. E. (13) Aug. 31.
 Machine Molding.* Wilfred Lewis. (3) Sept.
 The Design of a Double-Ended Marine Boiler.* John Gray. (94) Sept.
 Tests on Warm Air Furnaces.* Frank L. Busey. (70) Sept.
 Gas Engines; Their Design and Application. E. N. Percy. (95) Serial beginning Sept.
 Tests of Warm Air Furnace Pipe.* A. W. Glessner. (70) Sept.
 Mechanical Plant of the Madero Dock Granary, Buenos Aires.* (9) Sept.
 A New High Pressure Gas Blower Set.* W. J. A. London. (83) Sept. 1; (64) Aug. 22.
 The New Hinman Calorimeter.* (83) Sept. 1.
 The Operation of Water Gas Generating Machines. R. A. Wallace. (Paper read before the Canadian Gas Assoc.) (83) Sept. 1; (24) Aug. 14.
 Increasing the Efficiency of a Water-Gas Plant. John S. Haug. (Paper read before the Canadian Gas Assoc.) (83) Sept. 1.
 Modern Developments in Oil Engine Practice. E. Shackleton. (Abstract of paper read before the Inst. of Mar. Engrs.) (47) Serial beginning Sept. 1.
 An Aeroplane Factory and Its Work.* (12) Sept. 1.
 16-Ton Steam Crane Navy.* (12) Sept. 1.
 Ore Loading Plant, Island of Elba.* C. A. Tupper. (16) Sept. 2.
 The Gyrostatic Force of Rotary Engines.* Albert Kapteyn. (From *Flight*.) (19) Sept. 2.
 Increasing Efficiency of Rotary Pumps.* C. A. Tupper. (64) Sept. 5.
 Coke Oven Gas as an Open Hearth Fuel. Arthur P. Scott. (20) Sept. 7; (96) Aug. 31.
 Small Open Hearth Furnaces. Walter Macgregor. (Paper read before the Am. Foundrymen's Assoc.) (20) Sept. 7.
 Modern Mine Power Plant.* Guy C. Stoltz and Samuel Shapira. (16) Serial beginning Sept. 9.
 Superheater Using Waste Heat.* (19) Sept. 9.
 Récentes Applications du Moteur Diesel.* Ch. Dantin. (33) July 29.
 Etude de la Transmission de la Chaleur entre un Fluide en Mouvement et une Surface Métallique. Leprince-Ringuet. (37) Serial beginning July 31.
 Méthode pour l'Etude Expérimentale de l'Effet d'Amortissement des Empennages Horizontaux et des Surfaces Sustentatrices. G. de Bothezat. (37) July 31.
 La Transmission de la Chaleur dans les Générateurs de Vapeur.* M. Emanaud. (33) Aug. 5.
 L'Usine à Gaz du Landy (Seine) de la Société du Gaz de Paris.* R. Audra. (33) Serial beginning Aug. 12.
 La Fabrication Industrielle des Charbons pour Lampes à Arc. Jean Escard. (33) Serial beginning Aug. 19.
 Les Compteurs de Vapeur.* Eugène Grandmougin. (33) Aug. 19.
 La Fabrication des Pneumatiques.* (33) Aug. 26.
 Kammerlose Steilrohrkessel.* R. Ewald. (52) Serial beginning June 30.
 Die Bedingungen gegen das Abheben des Seiles bei Drahtseilbahnen.* A. Fliegner. (107) July 22.
 Der Guss einer Riesenschabotte.* O. Böhler. (50) July 27.
 Steigerung der spezifischen Leistung von Viertakt-Gasmaschinen mit Druckluftspülung.* Wilhelm Hellmann. (48) Serial beginning July 29.
 Die Riesenwerke der Indiana Steel Co. in Gary.* Fritz W. Lürmann. (50) Aug. 3.
 Die neuere Entwicklung der ortfesten Oelmaschine.* A. Nagel. (48) Aug. 12.
 Berechnung von Kolbenringen.* G. Barkhausen. (102) Aug. 15.
 Dampfdurchgangsverschnitte von Regelventilen.* P. Wagner. (48) Aug. 19.
 Die Bestimmung der Dampfkechtigkeit mit dem Drosselkalorimeter und die Anwendung desselben zur Prüfung von Wasserabscheidern.* Albert Sendtner. (48) Aug. 26.

*Illustrated.



Metallurgical.

- Electro-Plating Battery Plates.* J. D. Hubbard. (103) July 29.
 International Smelter at Tooele, Utah.* Leroy A. Palmer. (45) Aug.
 A Twentieth Century Cyanide Plant.* Charles E. Christensen. (45) Aug.
 Magnetic Separation of Ores.* Lucius L. Wittich. (45) Aug.
 Alloys. W. R. Whitney. (Paper read before the Am. Brass Founders Assoc.) (47) Aug. 4.
 The Crystallisation of Cast Metals. Cecil H. Desch. (Paper read before the British Foundrymen's Assoc.) (47) Aug. 11.
 Haselton Plant of the Republic Iron & Steel Company.* (20) Aug. 17.
 Metallography as an Aid to the Ironfounder.* John S. G. Primrose. (Paper read before the British Foundrymen's Assoc.) (47) Aug. 18.
 On the Selection and Use of Pyrometers. S. H. Stupokoff. (Paper read before the Am. Foundrymen's Assoc.) (47) Aug. 18.
 A Blast-Furnace Gas Meter.* (22) Aug. 18.
 Some Alloys for Permanent Magnets. C. F. Burgess and J. Aston. (Paper read before the Am. Electrochemical Soc.) (73) Aug. 18.
 Trojan Cyanide Mill, Black Hills. Jesse Simmons. (16) Aug. 19.
 Electric Steel Processes as Competitors of the Bessemer and Open Hearth. A. E. Greene. (Abstract of paper read before the Am. Electrochemical Soc.) (73) Aug. 25.
 Manganese and Silicon in Foundry Practice. A. E. Outerbridge, Jr. (Paper read before the Am. Foundrymen's Assoc.) (19) Aug. 26.
 The Elmore Flotation Process, The Specifications Showing the Original Claims for the Patents on Which the Process Is Based. (45) Sept.
 The Counter-Current of Continuous Agitation, Decantation, and Dilution Applied to the Cyanide Process.* John E. Rothwell. (105) Sept.
 Electric Tin Smelting. John Hårdén. (105) Sept.
 Electrolytic Production of Oxygen and Hydrogen and Welding and Cutting by the Oxyhydrogen Flame. (105) Sept.
 New Method for the Rapid Determination of the Total Carbon in Iron, Steel and Ferro-Alloys.* A. L. Queneau. (105) Sept.
 Refining of Silver and Gold Alloys.* Edward F. Kern. (105) Sept.
 Efficiency Methods in Cupola Operation. John Jermain Porter. (9) Sept.
 The Stock Process for Steel Castings.* (20) Sept. 7.
 Alloys Used for Die-Castings. E. F. Lake. (20) Sept. 7.
 Sur les Filiations d'Alliages Métalliques.* Le Gris. (93) Aug.
 Progrès Récents dans le Grillage des Sulfures.* Léon Guillet. (93) Aug.

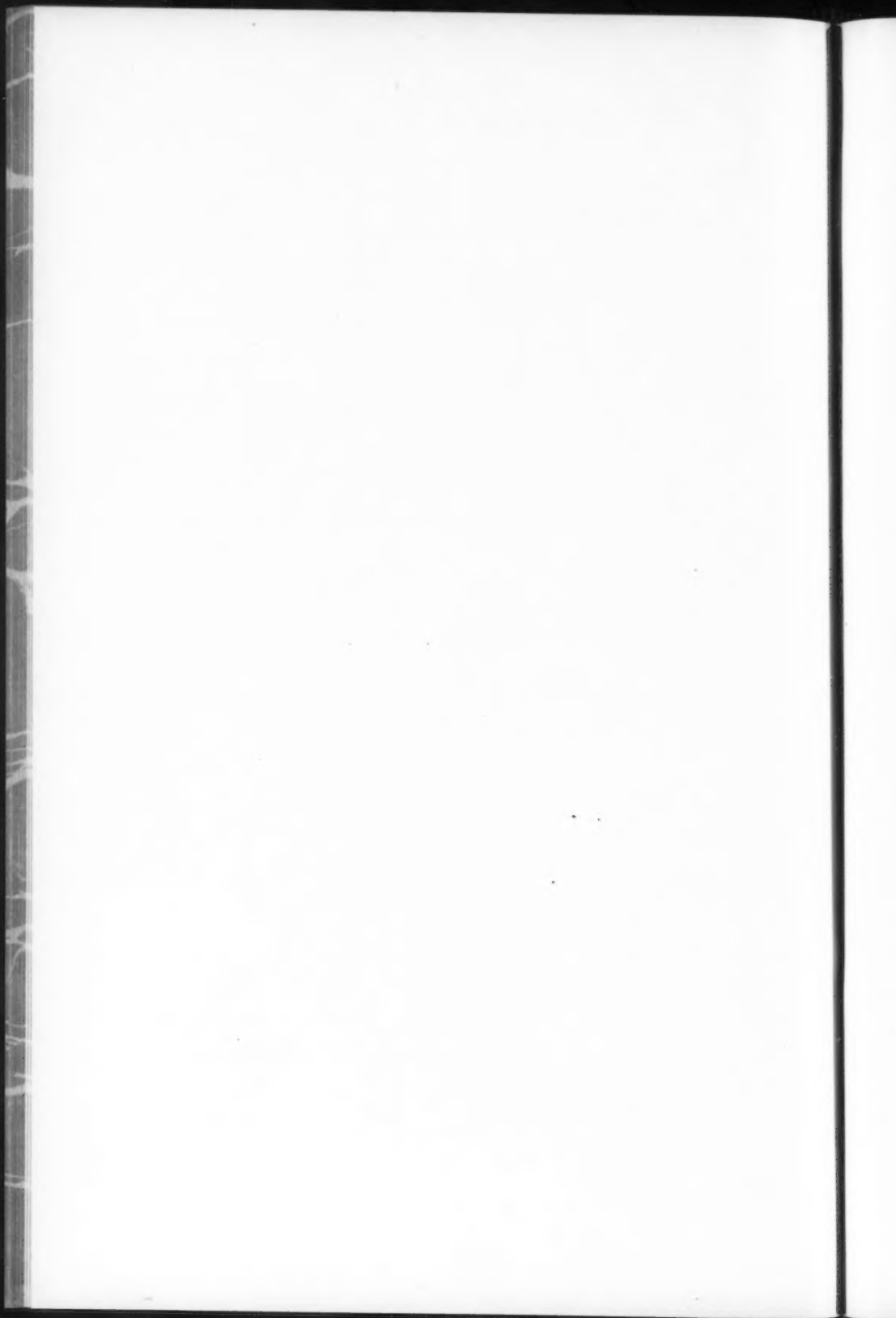
Military.

- The Question of the Combination Projectile.* Hubner. (19) Aug. 5.
 The Nitrogen Question from the Military Standpoint. Charles E. Munroe. (19) Aug. 19.
 Logistics. William C. Bartlett. (19) Aug. 26.
 Telegraph Battalions and Semi-Permanent Lines. C. de F. Chandler. (44) Sept.

Mining.

- High-Tension Mining Switch-Gear.* F. Bernard Clark. (106) Vol. 41, Pt. 4.
 A Flame-Test for the Estimation of Oxygen and Black-Damp in Naked-Light Mines. J. S. Haldane. (106) Vol. 41, Pt. 4.
 Reversing the Ventilation. T. A. Southern and H. W. Halbaum. (57) Serial beginning July 28.
 A New Face Conveyor.* T. Campbell Futers. (57) July 28.
 The Cranberry Iron Ore Mine.* J. M. Cameron. (45) Aug.
 Coal Mining in Arkansas, Method Used in Stripping Shallow Seams and in Mining Thin Seams With Partings.* A. A. Steel. (45) Aug.
 New Uses of Explosives in Agriculture. F. H. Gunsolus. (3) Aug.
 Electrical Equipment of the Sneyd Colliery, Burslem.* (57) Aug. 4; (22) Aug. 4.
 Cave-Ins in Oil Wells.* Dorsey Hager. (103) Aug. 5.
 Recent Developments in Diamond Mining.* C. A. Tupper. (103) Aug. 5.
 Efficiency of Fine Grinding Machinery. Walter H. Urbiter. (16) Aug. 5.
 The Sydvaranger Iron Mines.* Dwight E. Woodbridge. (16) Aug. 5.
 Concrete Drop Shafts in Shifting Sands.* P. B. McDonald. (From *Min. and Eng. News*.) (96) Aug. 10.
 The Economic Position of the Coal Industry of the United Kingdom. Allan Greenwell. (Abstract from paper read before the Inter. Soc. for the Promotion of Commercial Education.) (57) Serial beginning Aug. 11.
 Ropeway Plant for the Powell Duffryn Coal Company, Ltd., Aberaman, near Aberdare.* (68) Aug. 12.
 A Cone Friction for Mine Hoists.* (16) Aug. 12.
 Compressed-Air Locomotives for Coal Mines.* C. B. Hodges. (Paper read before the West Virginia Coal Min. Inst.) (22) Aug. 18.

*Illustrated.



Mining—(Continued).

- Experiments on Liquid Mixtures for Laying Coaldust. W. M. Thornton. (Paper read before the North of England Inst. of Min. and Mech. Engrs.) (57) Serial beginning Aug. 11; (47) Aug. 18.
- The Tin Deposits of Bolivia.* Miltiades Armas. (16) Serial beginning Aug. 19.
- Buying Air-Compressors.* R. L. Webb. (103) Aug. 19.
- Methods and Cost of Stripping with Steam Shovels in Utah.* L. A. Palmer. (Abstract from *Mining Magazine*.) (96) Aug. 24.
- The Potter's Clay Industry of Cornwall.* Harold J. Shepstone. (19) Aug. 26.
- The Saving of Fine Placer Gold.* Fred H. Hazard. (16) Aug. 26.
- Witwatersrand Mining Costs.* E. M. Weston. (16) Serial beginning Aug. 26.
- Mining Coal at Morgantown, W. Va.* R. B. Brinsmade. (16) Aug. 26.
- The Cornwall, Pa., Magnetic Deposits.* (45) Sept.
- The Coaldale Headhouse.* (45) Sept.
- American Gem Mines and Mining.* John L. Cowan. (45) Sept.
- Empire Mine and Mill, Grass Valley, Cal.* Al. H. Martin. (45) Sept.
- Coal Boring at Calvert.* (22) Sept. 1.
- Report on Rescue Apparatus. Committee Appointed by the South Midland Coal-owners. (57) Serial beginning Sept. 1.
- Shaw's Overwinder. T. Beach. (Paper read before the Midland Inst. of Min., Civ., and Mech. Engrs.) (57) Sept. 1.
- Construction of the Summit Hill Fire Barrier.* Francis Donaldson. (14) Sept. 2.
- The Ray Consolidated Copper Company.* Charles A. Dinsmore. (103) Sept. 2.
- Operating Costs and Mine Management. Charles Janin. (103) Sept. 2.
- The Cost of Mining in Nicaragua. Henry B. Kaeding. (16) Sept. 2.
- Standard Electric Practice at Mines. (Abstract of Rules of Am. Min. Congress.) (16) Sept. 2.
- Appraisal of Michigan Mines. J. R. Finlay. (16) Serial beginning Sept. 9.
- Prospecting for Brown Iron Ore. H. S. Geismar. (16) Sept. 9.

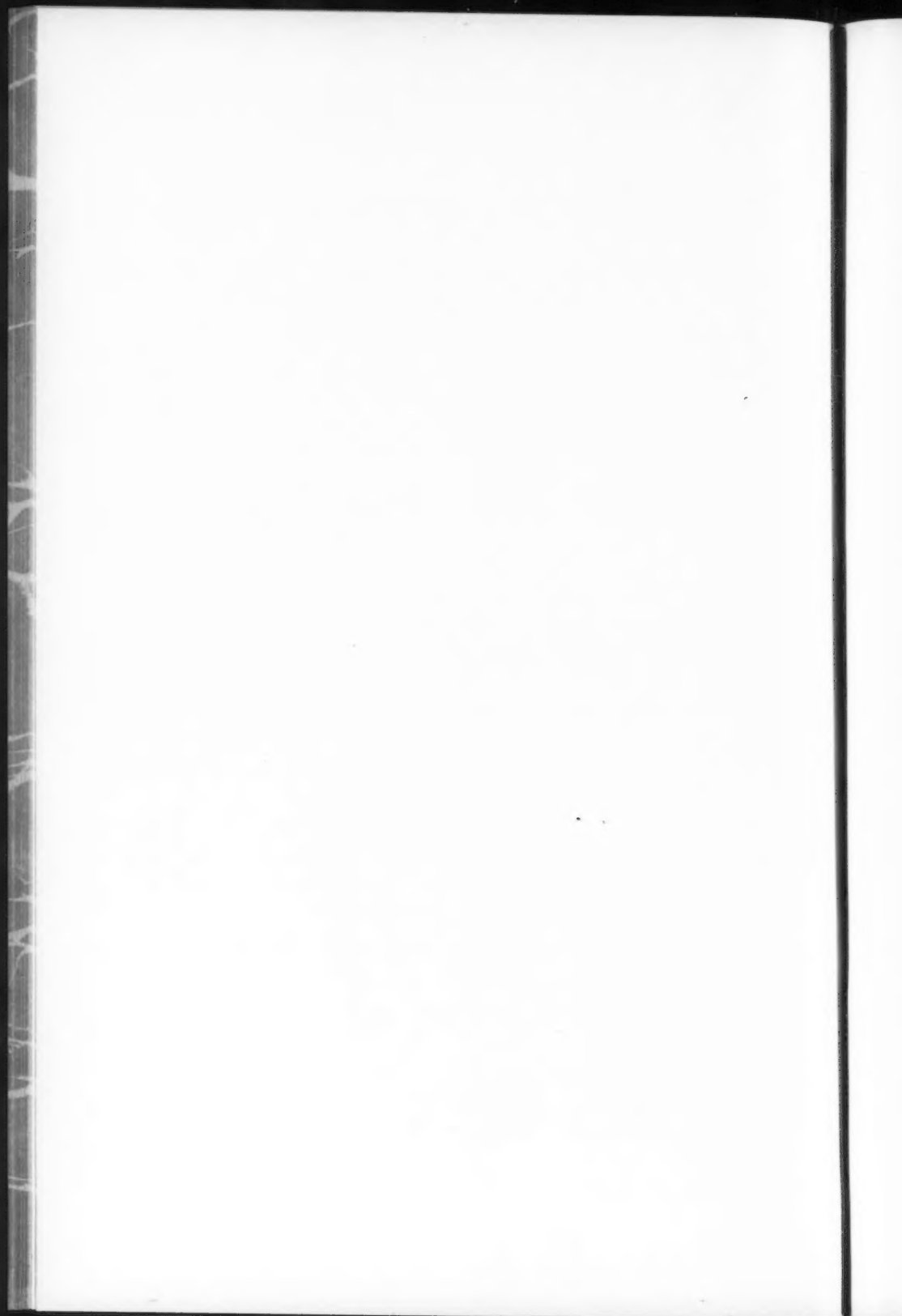
Miscellaneous.

- Address at the 43d Annual Convention, Chattanooga, Tennessee, June 13th, 1911. Mordecai T. Endicott, President, Am. Soc. C. E. (54) Vol. 73.
- The Conservation of Fishery Resources.* Hugh M. Smith. (46) Aug. 12.
- The Conservation of the Forests.* Gifford Pinchot. (46) Aug. 12.
- Engineering Specifications. Frank F. Fowle. (42) Sept.
- Pumping California Petroleum.* C. P. Bowie. (103) Sept. 2.
- Methods and Cost of Clearing Logged-Off Land in the Pacific Northwest. Harry Thomson. (Abstract of Circular No. 25, Bureau of Plant Industry.) (86) Sept. 6.
- Erddrucktheorie.* A. Hofmann. (81) Pt. 5.

Municipal.

- Street Paving Crowns, Washington, D. C.* T. J. Powell, Assoc. M. Am. Soc. C. E. (54) Vol. 73.
- Road Construction and Maintenance: An Informal Discussion Presented at the Meetings of January 20th and 21st, 1911. (54) Vol. 73.
- Surface Tarring of Highways. Guglielminetti. (104) July 28; (86) Aug. 16.
- Construction, Maintenance and Repair of Highways. W. Astley Norris. (Paper read before the Institution of Mun. Engrs.) (104) July 28.
- Street Curbs. Irving W. Stoddard. (67) Aug.
- Some Fallacies of Sidewalk Construction. Jerome B. Landeld. (67) Aug.
- Methods and Costs of Repairing Petrolithic Macadam, Oil Macadam and Surface Oiled Roads. W. A. Gillette. (86) Aug. 2.
- Cost of Asphalt Pavement Repairs and Data on Life of Asphalt Pavement at Buffalo, N. Y. (86) Aug. 2.
- Superelevation for Curves on Macadam Roads.* (13) Aug. 3.
- Tests of Oil-Cement Concrete in Roads. (96) Aug. 3.
- Standard Plans and Specifications for Paving, Seattle, Wash. (86) Aug. 9.
- Methods of Constructing Roads Subject to Overflow and of Preventing Erosion of Roads and Ditches.* (86) Aug. 9.
- Pneumatic Hammers for Tearing-Up Street Pavements.* Frank Richards, M. Am. Soc. M. E. (13) Aug. 10.
- Brick Paving for Roads in Illinois and Ohio.* (13) Aug. 10.
- Fire Protection in Towns. Reginald Brown, Assoc. M. Inst. C. E. (Paper read before the Institution of Mun. and County Engrs.) (104) Serial beginning Aug. 11.
- Recommended Specifications for Bituminous Material (Roads). T. Warren Allen. (14) Aug. 12.
- The Construction and Maintenance of Earth Roads in the South. W. S. Keller. (Paper read before the Good Roads Congress.) (96) Aug. 17.
- A Prepared Filler for Macadam Roads.* Charles H. Hoyt. (13) Aug. 17.
- Highway Improvement and Maintenance. H. P. Maybury, M. Inst. C. E. (Paper read before the Institution of Mun. and County Engrs.) (104) Aug. 18.

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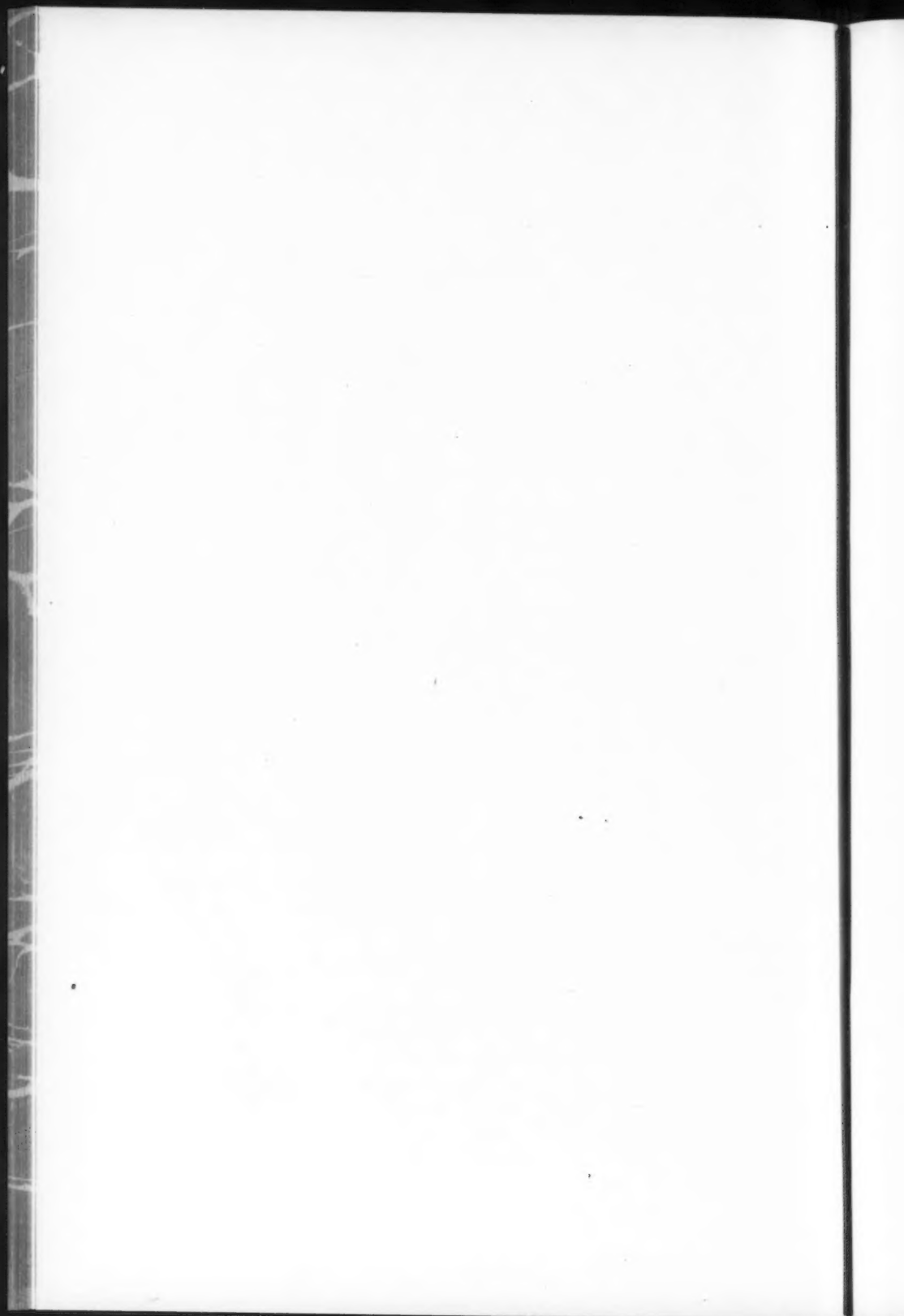
Municipal—(Continued).

- Collection of Data for Standardisation of Road Construction and Maintenance. D. Ellison, Assoc. M. Inst. C. E. (Paper read before the Inst. of Mun. and County Engrs.) (104) Aug. 18.
- The Dust Nuisance: Its Evils and Abatement. John S. Brodie, M. Inst. C. E. (Paper read before the Royal Sanitary Inst.) (104) Aug. 18.
- Smoke Abatement in London and Hamburg. John B. C. Kershaw. (26) Aug. 18.
- Calcium Chloride for Dust Prevention.* (104) Aug. 25.
- Road Construction in San Diego County, California. (14) Aug. 26.
- Service Test of Road Materials by the Road Board of Great Britain and a Description of Various English Proprietary Paving Materials. (86) Aug. 30.
- Two Reports on Paving Materials and Work in Chicago. (13) Aug. 31.
- Contracting Practice. DeWitt V. Moore, M. Am. Soc. Eng. Contrs. (60) Sept.
- The Ohio State Experimental Road.* (60) Sept.
- What is the Best Street Pavement? J. C. Travilla. (60) Sept.
- Special Road Problems in Southern States. D. H. Winslow. (Abstract of Circular, U. S. Office of Public Roads.) (14) Sept. 2.
- Methods for Examination of Bituminous Road Materials. Prevost Hubbard and Charles S. Reeve. (Bulletin No. 38, Office of Public Roads, U. S. Dept. of Agriculture.) (62) Sept. 4.
- An Economic Study of Snow Removal in Cities by Means of Melting Machines.* Nathan C. Johnson. (86) Sept. 6.
- Der Bahnhofsvorplatz in Hannover.* Blum. (81) Pt. 5.

Railroads.

- Mixed Traffic Engine, Soudan Government Railways.* (12) July 28.
- Hot Water Supply for Railway Carriage Lavatories.* (21) Aug.
- The Reconstruction of Clapham Junction Station, London, Brighton and South Coast Railway.* (21) Serial beginning Aug.
- Lock-and-Block on the Victorian Government Railways.* (21) Aug.
- Permanent Way of the Swiss Federal Railways.* (21) Aug.
- Automatic Signals with Train Stops on High-Speed Inter-Urban Lines.* (21) Aug.
- The New C. & N. W. Ry. Terminal at Chicago.* W. C. Armstrong. (87) Aug.
- Installing Blind Stay-Bolts.* (Locomotives.) H. S. Jeffrey. (94) Aug.
- A Proposed Modification in Railway Freight Yard Design.* (13) Aug. 3.
- Railway Tests of Air-Brakes: 1878-1909. (13) Aug. 3; (96) Aug. 17.
- Electrical Operation of the West Jersey & Seashore Railroad.* B. F. Wood. (42) Aug.
- Locomotive Performance Under Different Degrees of Superheated Steam.* C. H. Benjamin and Louis E. Endsley. (Paper read before the Am. Master Mechanics' Assoc.) (47) Aug. 4.
- Single-Phase Electric Locomotive for the Compagnie du Midi, of France.* (73) Aug. 4.
- Petrol-Electric Railway Motor Car.* (12) Aug. 4.
- Development of the Aurora, Elgin & Chicago Railroad.* (17) Serial beginning Aug. 5.
- Four-cylinder Compound German Freight Locomotive.* (19) Aug. 5.
- New Cars for Arkansas Valley Interurban Railway.* (17) Aug. 5.
- Electrification of an English Railway.* (18) Aug. 5.
- Tests to Determine the Necessary Depth of Stone Ballast.* (Abstract of Penn. R. R. Report.) (86) Aug. 9.
- Making a 300 000 Cu. Yd. Railroad Embankment with Hydraulic Dredge.* George H. Bremner. (86) Aug. 9.
- The Preservation of Trestle Stringers and Caps by Means of Housing.* Hunter McDonald, M. Am. Soc. C. E. (Abstract of paper read before the Eng. Assoc. of the South.) (96) Aug. 10.
- Four-Cylinder Passenger Locomotive at the Turin Exhibition.* (11) Aug. 11.
- The North Coast Railroad.* (15) Aug. 11.
- Ductility in Rail Steel. P. H. Dudley. (Paper read before the Am. Soc. for Testing Materials.) (15) Aug. 11.
- Steel Cars for the Newark Extension of the Hudson Tunnels.* (17) Aug. 12.
- Gas Electric Car for San Francisco Railroad. (17) Aug. 12; (27) Aug. 12; (18) Aug. 26; (25) Sept.
- Cross-Tie Records on the Sante Fé Railway System. (14) Aug. 12.
- Construction of the Paulding-Mace Avenue Subway, New York.* (14) Aug. 12.
- The New Chicago Terminal Station of the Chicago & Northwestern Ry.* (13) Aug. 17.
- Feed-Water Heating and Superheating on Locomotives. (11) Serial beginning Aug. 18.
- Detroit River Tunnel Yards.* (15) Aug. 18.
- Removal of Excavated Material, Grand Central Terminal.* (14) Aug. 19.
- The Canton-Hankow Railway.* (14) Aug. 19.
- A Problem in Railway Location. L. B. Merriam. (14) Aug. 19.
- Railway Terminal Power Plant.* (27) Aug. 19.

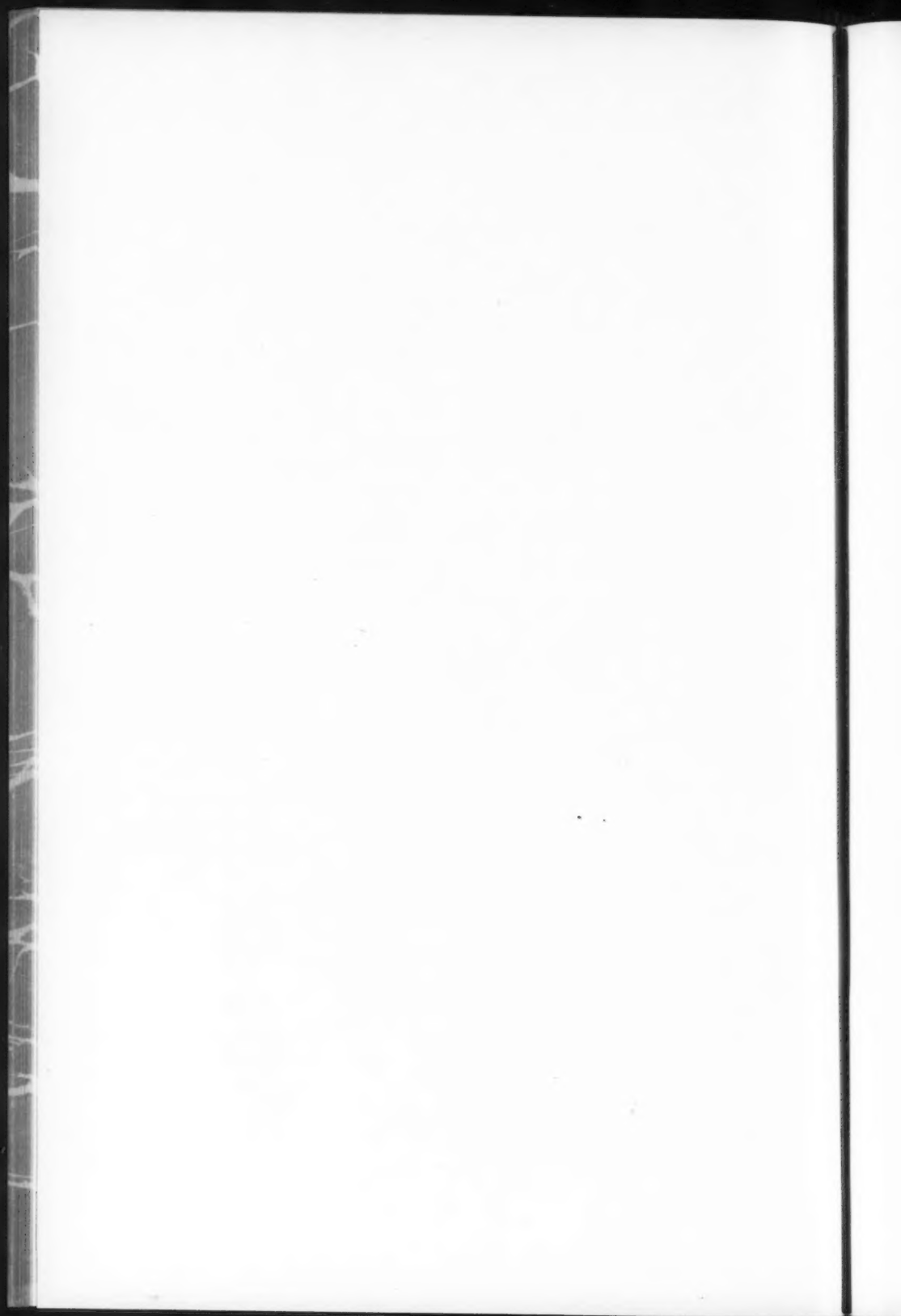
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Railroads—(Continued).

- Kerwin-Detroit Rail Grinder.* (17) Aug. 19.
 Motor Cars for Tunnel and Suburban Service, Pennsylvania R. R.* (18) Aug. 19.
 Japanese Railways. James F. Paige. (Abstract of paper read before the New England R. R. Club.) (47) Aug. 25.
 The Peking-Kalgan Railway; China's Most Difficult Piece of Construction.* Lewis R. Freeman. (15) Aug. 25.
 The Burlington Suction Dredge. (Railroad Construction.) (15) Aug. 25.
 Train Resistance. W. F. Kiesel, Jr. (15) Aug. 25.
 Mallet Locomotive with 20 Drivers, for the Santa Fé.* (15) Aug. 25.
 The Electric Locomotives for the Lötschberg Tunnel.* (19) Aug. 26.
 A 35-Ton Electric Locomotive for the Woodward Iron Works.* (18) Aug. 26.
 The Car Shops of the Hudson & Manhattan Railroad in Jersey City. Structures Combining Structural Steel and Reinforced Concrete.* J. B. French. M. Am. Soc. C. E. (14) Aug. 26.
 Northwestern Terminal in Chicago.* (27) Aug. 26.
 Mikado Type Locomotives for the Illinois Central R. R.* (18) Aug. 26.
 Electric Motor Cars for Tunnel Service.* (25) Sept.
 Heavy Double-Ended Locomotives for Mexico.* (25) Sept.
 Superheater Freight Locomotive 2-8-2 Type, Illinois Central Railroad.* (25) Sept.
 Test of Simple 4-4-2 Type Locomotive on the Altoona Testing Plant, Pennsylvania Railroad.* (25) Sept.
 0-8-8-0 Type Locomotive with Superheater, Delaware & Hudson Company. (25) Sept.
 An Unusual Type of Flat Car.* (25) Sept.
 Measurement of Steam Discharge in Locomotive Pop-Valves. (25) Sept.
 Express Locomotives with Allfree Cylinder and Valves, Pittsburgh & Lake Erie R. R.* (25) Sept.
 Novel Narrow Gauge Locomotive for an Indian Mountain Railway.* (25) Sept.
 The Locomotive Boiler.* Robert H. Rogers. (From *Railroad Man's Magazine*.) (94) Sept.
 The North-Eastern Railway Company's New Locomotive Boiler Shop.* (47) Sept. 1.
 Corcovado Electric Railway.* (73) Sept. 1.
 New Baltic Type Locomotive, Northern Railway of France.* (12) Sept. 1.
 New Shops at Rockford, Ill.* (17) Sept. 2.
 Electric Locomotive with Permutators in France.* (17) Sept. 2.
 Proper Methods to be Observed in the Efficient Handling of the Electric Locomotive.* (Abstract of paper read before the Traveling Engrs.' Assoc.) (18) Sept. 2.
 Adequate Braking Power for Freight Cars.* John P. Kelly. (Abstract of paper read before the Air Brake Assoc.) (18) Sept. 2.
 Value of Actual Demonstration as Compared with Oral Instruction in Air Brake Operation. (Paper read before the Traveling Engrs.' Assoc.) (18) Sept. 2.
 Hospital Cars of the Swiss Federal Railways.* Alfred Gradenwitz. (46) Sept. 2.
 Preliminary Surveys for the Puebla & Pacific R. R. of Mexico.* H. N. Roberts. (13) Sept. 7.
 Station and Terminal Yards of Canadian, Northern and Grand Trunk Pacific at Winnipeg.* J. Schofield. (15) Sept. 8.
 Practical Instruction in Fuel Economy. V. C. Randolph. (Paper read before the Traveling Engrs.' Assoc.) (15) Sept. 8; (18) Sept. 2.
 Steelwork Erection at the New York Terminal of the Pennsylvania Railroad.* (14) Sept. 9.
 A Reinforced Concrete Roundhouse for the New Haven Railroad.* (14) Sept. 9.
 Chicago & Alton Locomotive Terminal at Bloomington.* (14) Sept. 9.
 Locomotive du Type dit *Adriatic*, des Chemins de Fer de l'Etat autrichien.* M. Emanaud. (34) Aug.
 Note sur les Travaux de Reconstruction de la Gare de Cambrai.* Plat et Wargniez. (38) Aug.
 Elektrische 250 PS-Lokomotive der Valle-Maggia-Bahn. Georges Zindel. (107) July 15.
 Die Schneeschleudermaschine der Berninabahn.* E. Gysel. (107) July 29.
 Hebeböcke für Eisenbahnfahrzeuge. K. Kramár. (102) Aug. 1.
 Die Eisenbahnhauptwerkstätte Saarbrücken-Burbach nach ihrer Erweiterung.* W. Schumacher. (102) Serial beginning Aug. 1.
 Der elektrische Betrieb auf der Strecke Spiez-Frutigen der Berner Alpenbahn.* (107) Aug. 12.
 Ueber die Absteckung des Lötschbergtunnels.* F. Baeschlin. (107) Serial beginning Aug. 26.
- Railroads, Street.**
 Schöneberg-Berlin Underground Railway.* (17) Aug. 5.
 Electric Railways in Buenos Aires.* (17) Aug. 5.
 Method of Making Track Special Work Surveys.* Philip J. Kealy. (86) Aug. 9.

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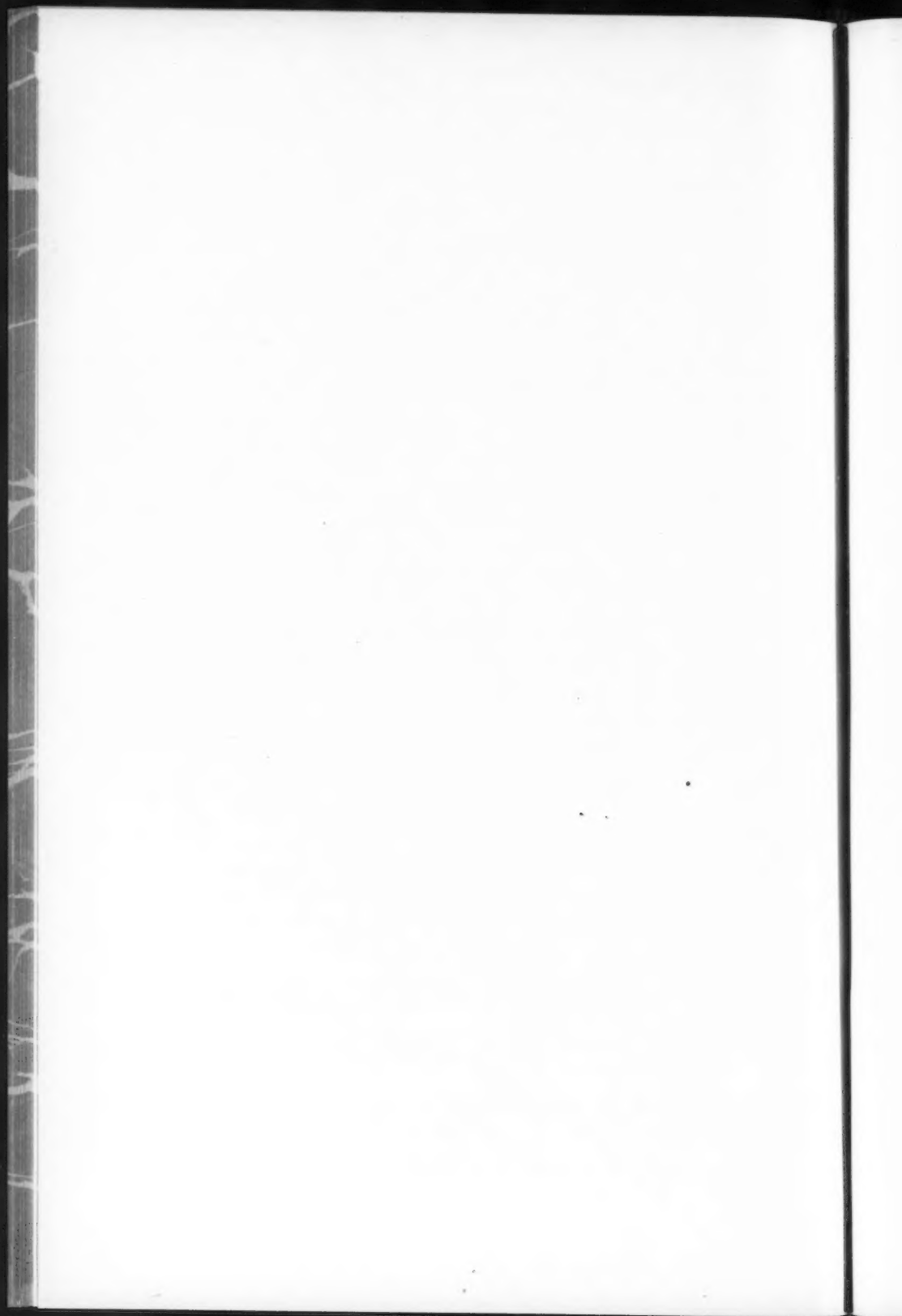
Railroads, Street—(Continued).

- Methods of Increasing the Efficiency of Surface Lines in Large Cities. Williston Fish. (Abstract from the *Annals* of the American Academy of Political and Social Science.) (96) Aug. 10.
- The Buffalo Near-Side Single-Platform Car.* (73) Aug. 11.
- Sprinkler System in Open Yard of Manhattan Elevated Railway.* (17) Aug. 12.
- New Type of Storage-Battery Car.* (17) Aug. 19.
- Newark Rapid Transit Car.* (19) Aug. 19.
- Arnold Report on Providence Transportation Conditions.* (17) Aug. 19.
- The New Paris Underground Railway.* (73) Aug. 25.
- Faster Operation Versus Multiple-Unit Trains.* Clarence Renshaw. (Paper read before the Central Elec. Ry. Assoc.) (17) Aug. 26.
- New Power Station of Worcester Consolidated Street Railway.* (17) Aug. 26.
- Two New Rail Joints for Street Railway Track.* (13) Aug. 31.
- The Efficiency of Sanded Tracks in Sidings for Car Retardation.* (From *Deutsche Strassen-und-Kleinbahn-Zeitung*.) (17) Sept. 2.
- London's Electric Trains.* (19) Sept. 9.

Sanitation.

- The Emscher Sewerage District and the Imhoff Tank.* Charles Saville. (Paper read before the Boston Soc. of Civil Engrs.) (1) July.
- Specifications for and Cost of Concrete Sewer Pipe at Bellingham, Wash. H. A. Whiskey. (67) Aug.
- The Hudson Sewage Disposal System and the Disastrous Effects of Wool Waste.* Frank A. Barbour. (Paper read before the Boston Soc. of Civ. Engrs.) (1) Aug.
- The Disposal of Manufacturing Waste.* R. S. Weston. (Paper read before the Boston Soc. of Civ. Engrs.) (1) Aug.
- Reclamation of Tide Lands. J. O. Wright. (From *Bulletin*, U. S. Dept. of Agri.) (87) Serial beginning Aug.
- Sewage Disposal with Respect to Offensive Odors. George W. Fuller, M. Am. Soc. C. E. (60) Serial beginning Aug.
- Sewage Purification. S. Rideal. (Paper read before the Royal Sanitary Inst.) (104) Aug. 4.
- The Dale Avenue Sewer in St. Louis.* (14) Aug. 5.
- Design and Construction of the Baltimore Sewerage System.* Calvin W. Hendrick. (86) Aug. 9.
- Hygienic Equipment for Modern Homes.* (101) Aug. 11.
- The Discharge of Sewage Into Tidal Waters and Chemical Principles Involved. William Harpur and E. A. Letts. (Papers read before the Royal San. Inst.) (104) Serial beginning Aug. 11.
- The Operation of the Milwaukee Incinerator. (14) Aug. 12; (13) Sept. 7.
- Reclamation of River Bottom Lands.* John J. Harman. (Paper read before the Iowa Drainage Assoc.) (76) Aug. 15.
- Drainage in Eastern England: Comparison of English and American Drainage Methods, Giving Results of Observations Made by C. G. Elliott.* (76) Aug. 15.
- Proposed Basis for Rating House-Heating Boilers and Furnaces.* Frank L. Busey. (Abstract of paper read before the Am. Soc. of Heating and Ventilating Engrs.) (64) Aug. 15.
- Laying of Drain Tile.* A. F. Greaves-Walker. (Paper read before the Northwestern Drain Tile Assoc.) (76) Aug. 15.
- Standards for Rating and Installing Furnaces. (Paper read before the Nat. Assoc. of Sheet Metal Contractors.) (101) Aug. 18.
- The Flushing System for the Gowanus Canal, Brooklyn.* (14) Aug. 19.
- Sewage Purification at the Montmesly Works, Paris.* (14) Aug. 19.
- Methods and Costs of Tunnel and Open Cut Excavation in Sandstone for a Sewer at Pratt City, Alabama.* (86) Aug. 23.
- Proposed Intercepting Sewers and Sewage Disposal in New Bedford, Mass.—A Study in Design.* (86) Aug. 23.
- Comparative Costs of Sewage Purification. (96) Aug. 24.
- A Large Fan and Air Conditioning System for a Cotton Mill.* L. L. Lewis. (13) Aug. 24.
- The Laying and Testing of Earthenware Sewers and Drains.* A Sayers. (Abstract of paper read before the Royal San. Inst. Congress.) (104) Aug. 25.
- Heating by Exhaust Steam. George G. Bennett. (From *Southern Engineer*.) (47) Aug. 25.
- Experimental Sewage Purification at Worcester.* (14) Aug. 26.
- The Significance of Flora and Fauna in Maintaining the Purity of Natural Waters and How They Are Affected by Domestic Sewage and Industrial Wastes. Emil Kulchling, M. Am. Soc. C. E. (Tr. from German article by Maximilian Marsson.) (13) Aug. 31.
- Notable Tunnel Ventilating Plant.* (20) Aug. 31.
- Heating and Ventilating High School Buildings at Decatur, Ill.* Samuel R. Lewis. (70) Sept.
- Steam Heating in an Exposed Club House.* (101) Sept. 1.

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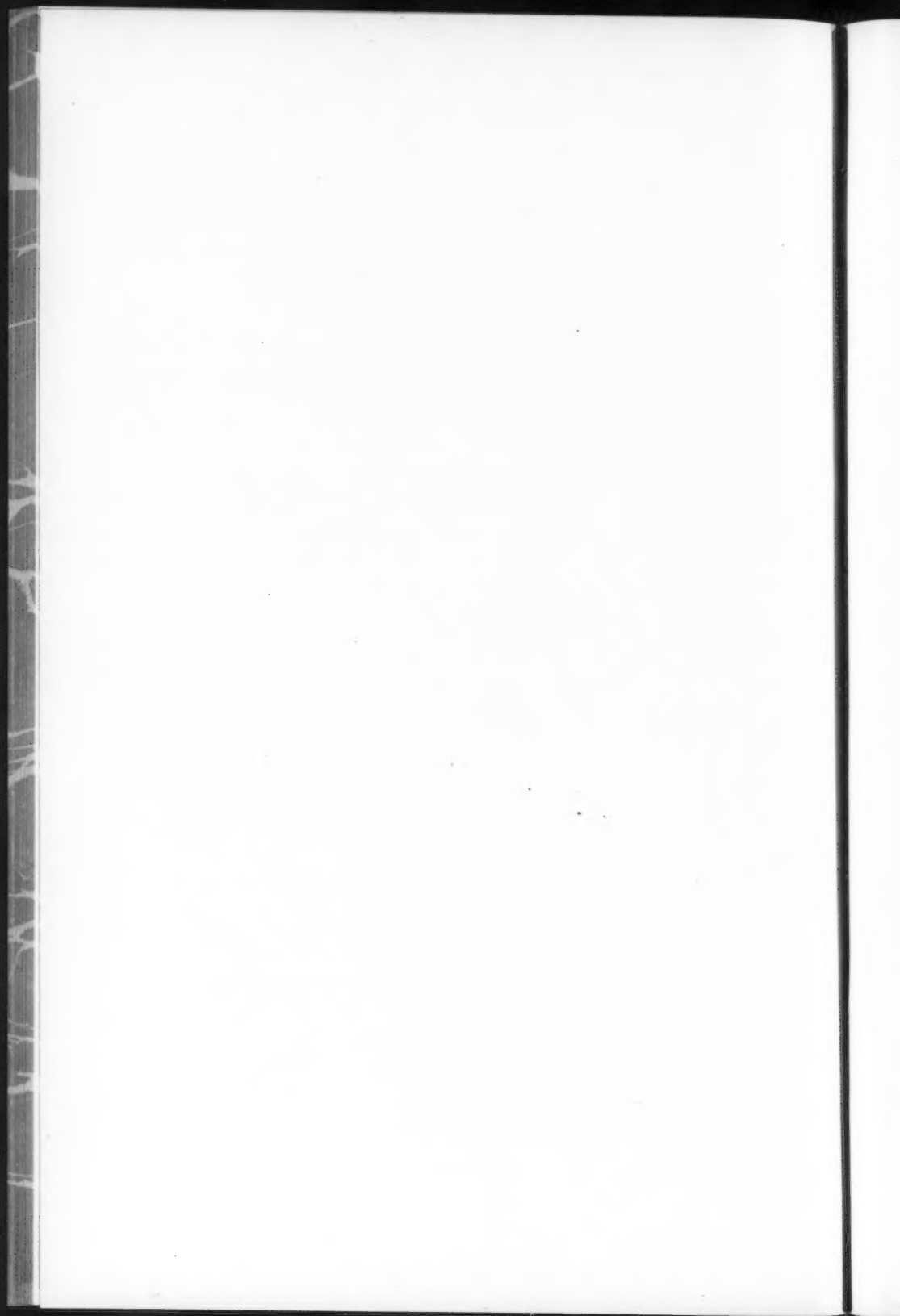
Sanitation—(Continued).

- The Proposed Disinfection of Sewage at New Bedford. (14) Sept. 2.
 Methods and Cost of Vitrified Clay Conduit Construction in Salt Lake City.
 R. E. Frolseth. (86) Sept. 6.
 Design of Sewers and Sewage Purification Plant for La Grange, Illinois.* Frank
 L. Stone. (86) Sept. 6.
 A Temporary Screening Plant at Flushing.* (14) Sept. 9.

Structural.

- Bond-Friction-Resistance in Reinforced Concrete.* William Fry Scott, Assoc. M.
 Am. Soc. C. E. (54) Vol. 73.
 Some Tests of Large Steel Columns.* James E. Howard. (54) Vol. 73.
 The Strength of Steels in Compound Stress, and Endurance Under Repetition of
 Stress.* L. B. Turner. (11) Serial beginning July 28.
 The Design of Eccentrically Loaded Concrete Members Reinforced on One Face
 Only. Charles H. Dutton. (Paper read before the Boston Soc. of Civ. Engrs.)
 (1) Aug.
 Furnace Slags in Concrete.* (87) Aug.
 The Economical Design of a Reinforced-Concrete Floor Panel.* J. Norman Jensen.
 (13) Aug. 3.
 Ferrite Cements and Ferro-Portlands. Edwin C. Eckel, Assoc. Am. Soc. C. E.
 (13) Aug. 3.
 Standard Plans and Specifications for Retaining Walls.* (96) Aug. 3.
 General Notes on Placing Steel Reinforcement. Jerome Cochran. (14) Aug. 5.
 Earthquake Provisions in an Office Building.* (14) Aug. 5.
 Steel Superstructure of the Pennsylvania Terminal Post Office, New York.* (14)
 Aug. 5.
 Methods and Costs of Constructing Reinforced Concrete Cisterns.* R. A. Boothe.
 (86) Aug. 3.
 Concrete Drop Shafts in Shifting Sands.* P. B. McDonald. (From *Min. and*
Eng. News.) (96) Aug. 10.
 A Concrete Grain Elevator at Buffalo.* (14) Aug. 12.
 Vanadium Alloys in Steel Forgings.* (62) Aug. 14.
 The Manufacture of Concrete Building Blocks. R. F. Havlik. (Abstract of
 paper read before the Canadian Cement and Concrete Assoc.) (86) Aug. 16.
 Some Tests of the Rate of Corrosion of Metals Exposed in a Gaseous Atmosphere.
 A. W. Carpenter. (96) Aug. 17.
 A British Example of Electrolytic Corrosion of Steel in a Reinforced-Concrete
 Structure. (13) Aug. 17.
 The Condition of the Steel of the Gillender Building; Final Report.* Maximilian
 Toch. (13) Aug. 17.
 The Safe Load and Deflection of Helical Springs.* G. T. Thomas. (12) Aug. 18.
 Aluminium in Automobile Work. Henry Souther. (From *Cycle and Automobile*
Trade Journal.) (47) Aug. 18.
 Making Flat Skylights.* (101) Serial beginning Aug. 18.
 The Construction of the Bankers Trust Building, New York.* (14) Aug. 19.
 British Standard for Reinforced Concrete Construction.* (86) Aug. 23.
 An Analysis of the Stresses in Guy Wires.* W. M. Wilson. (96) Aug. 24.
 Testing Clinker Concrete.* John Charles Davis. (96) Aug. 24.
 Sprinklers in Knock-Down Form. How the Rockwood Sprinkler Company Has Ar-
 ranged and Equipped Its Chicago Works.* (20) Aug. 24.
 A New American Crucible Steel Plant.* (From *Iron Trade Review*.) (22)
 Aug. 25.
 The Roping Process of Creosoting.* (73) Aug. 25.
 Fire Lines on Manhattan Bridge.* (101) Aug. 25.
 A Judicial Interpretation of a Reinforced Concrete Building Contract. (14)
 Aug. 26.
 The Woolworth Building Foundations.* (14) Aug. 26.
 Concrete Pile Driving Practice on the Burlington Railroad.* L. J. Hotchkiss.
 (14) Aug. 26.
 Securing Battery Posts.* Francis W. Sewell. (From *Inf. y Mem. del Inst.*
Mexicano de Min. y Metalurgia.) (103) Aug. 26.
 Concrete in New York Subway Work.* (62) Aug. 28.
 Water Heaters. R. C. Frampton. (Paper read before the Wisconsin Gas Assoc.)
 (24) Aug. 28.
 Artificial Silk Mantles.* Nass. (Abstract.) (66) Aug. 29.
 Methods of Construction of a Shaft and Extension to the South West Land Tunnel,
 Chicago, With Unit Labor Expended.* (86) Aug. 30.
 Clay Conservation in the East.* Allen E. Beals. (76) Sept. 1.
 Reclaiming Scrap Material.* A. A. Burkhard. (15) Sept. 1.
 Building a Large Concrete Shop in Freezing Weather. (14) Sept. 2.
 Deep Underpinning in Very Narrow Clearance. (14) Sept. 2.
 The New Mills of the American Rolling Mill Company.* (14) Sept. 2; (20)
 Aug. 31.
 An Official German Recognition of the Harmless Nature of a Slag Addition to
 Portland Cement Clinker. (13) Sept. 7.

*Illustrated.



Structural—(Continued).

- Standard Design for Reinforced-Concrete Railway Stations; Wabash Ry.* (13) Sept. 7.
- Progress on Boston Custom House Foundations.* (14) Sept. 9.
- The Effect of Hydrated Lime on Portland Cement Mortar.* Harry Gardner. (14) Sept. 9.
- Underpinning a Fifteen-Story Building on Grillage Foundations.* (14) Sept. 9.
- The Maryland Steel Company's Open Hearth Building.* (14) Sept. 9.
- Essai des Tôles à la Perforation.* L. Persoz. (93) Aug.
- Appareils pour l'Essai de Fragilité des Métaux.* (34) Aug.
- Les Méthodes d'Essai des Matériaux de Construction au Congrès de Copenhague.* E. Van Volsom. (30) Aug.
- Vibrations Transversales d'une Barre Élastique dont la Période est Commandée par un Moteur Alternatif. J. Résal. (93) Aug.
- Der Elastizitätsmodul eines Betongewölbes.* R. Färber. (51) Serial beginning Sup. No. 15.
- Beton- und Eisenbetonbauten in den Vereinigten Staaten von Nordamerika.* Franz Widmann. (51) Serial beginning Sup. No. 14.
- Eisenbetonkonstruktionen der Markuskirche in Frankfurt a. M.-Bockenheim.* Arthur Laufer. (78) Aug. 4.
- Die Eisenbetonkonstruktionen für das Altenheim in Tenever.* Hans Leitner. (78) Aug. 4.
- Die Schweizerische Verordnung betreffend Berechnung von eisernen Brücken- und Dachkonstruktionen.* A. Buhler. (107) Aug. 5.
- Die Bühneneinrichtung des neuen Stadttheaters in Freiburg i. B.* Albert Rosenberg. (48) Aug. 19.
- Ueber die Wärmebehandlung der Stähle.* H. Hanemann. (50) Aug. 24.
- Erweiterungsbauten der Holzbearbeitungsfabrik Brüning & Sohn in Langendiebach bei Hanau.* E. Neugeboren. (78) Serial beginning Aug. 24.
- Ein Erz- und Kalksteinsilo und ein Kokstransporttunnel in Eisenbeton.* E. Elwitz. (78) Aug. 24.

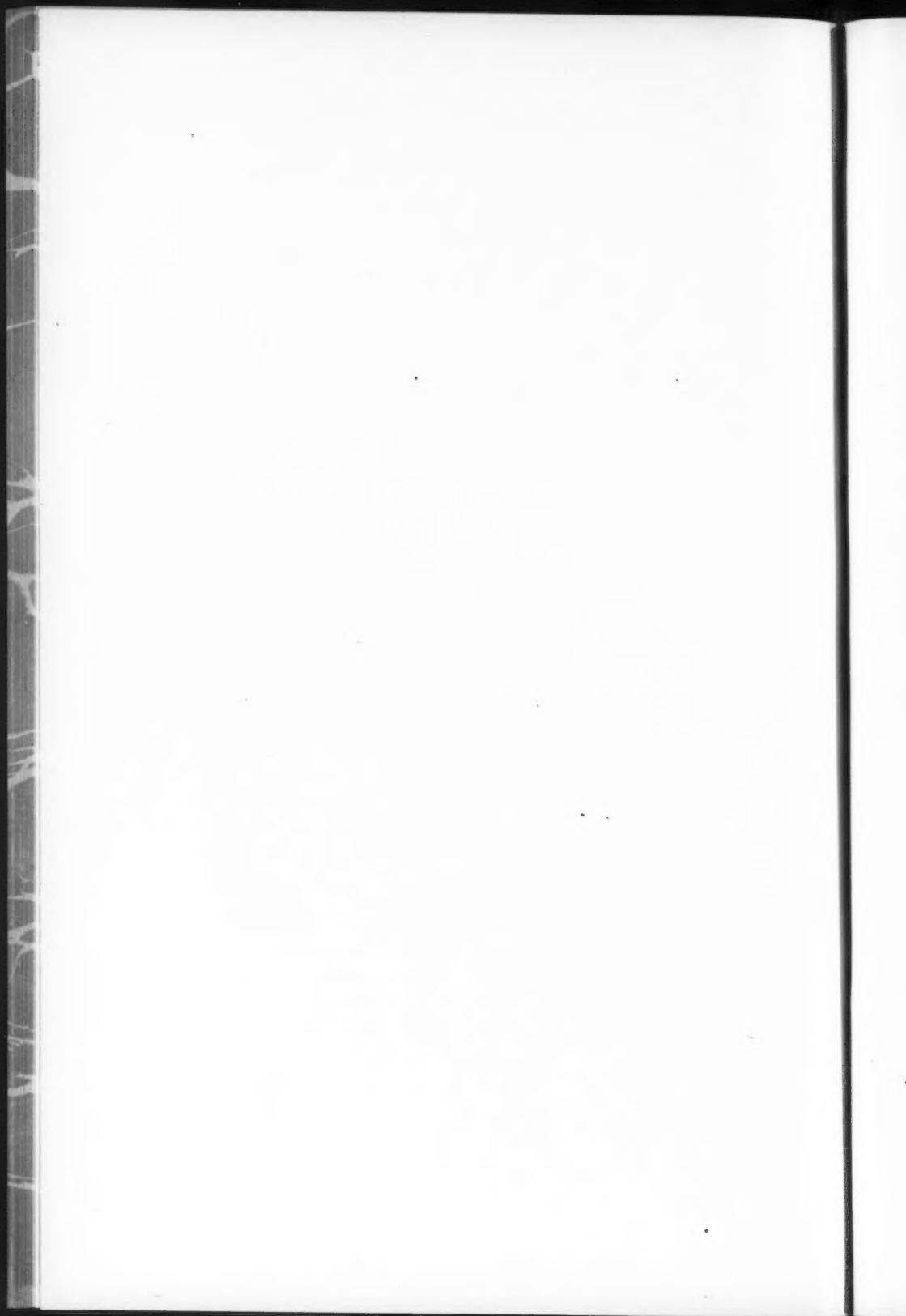
Topographical.

- Filling in Maps.* Edwin A. Sperry. (103) Aug. 5.
- Methods of Making Topographical Surveys and Their Cost. D. L. Reaburn, M. Am. Soc. C. E. (13) Aug. 10.
- The Great Star Map. H. H. Turner. (19) Serial beginning Sept. 2.

Water Supply.

- The Going Value of Water-Works. Leonard Metcalf and John W. Alvord, Members, Am. Soc. C. E. (54) Vol. 73.
- Sinking a Wet Shaft.* John P. Hogan, Jun. Am. Soc. C. E. (54) Vol. 73.
- Some Difficulties in the Purification of Water Supplies. Gardner T. Swarts. (28) June.
- Report of the Committee Appointed to Investigate the Conditions Under Which Extensions of Main Water Pipes are Made. (N. E. W. W. Assoc.) (28) June.
- The Reforestation of Watersheds for Domestic Supplies. F. W. Rane. (28) June.
- Practical Forestry for Water Works. Edward Sohler Bryant. (28) June.
- Desirable Pressure at Hydrants.* E. V. French. (28) June.
- Electrolysis of Water System Underground Structures in Pittsburgh.* E. E. Lanpher and L. B. Smith. (58) July.
- The Catskill Water System of the City of New York.* H. Prime Kieffer. (11) July 28.
- Waste of Water in Buffalo, N. Y. (60) Aug.
- Investigations of Water Waste in Memphis, Tenn. Carl E. Davis. (60) Aug.
- Preliminary Drainage Surveys.* J. L. Parsons. (86) Aug. 2.
- Standard Plans and Specifications for Water Mains, Seattle, Wash.* (86) Aug. 2.
- Speed Regulation in the Electric Power Plants of Sioux Falls, S. D.* H. B. McDermid. (13) Aug. 3.
- Water Losses in Irrigation Canals and Methods of Prevention. F. W. Hanna. (Paper read before the Idaho Soc. of Engrs.) (96) Aug. 3.
- Building the Hydroelectric Plant of the Mississippi River Power Company.* (14) Aug. 5.
- Laying a 30-Inch Riveted Steel Pipe at Riverside. (14) Aug. 5.
- Operating Results at the St. Louis Water Coagulating Works.* (14) Aug. 5.
- The Construction of the New Hauslerlake Dam.* Barrett Smith. (13) Aug. 10.
- Earth Dams. A. M. McPherson. (Paper read before the Idaho Soc. of Engrs.) (96) Aug. 10.
- Water Waste and Water Famine in Dallas, Texas. (13) Aug. 10.
- Geological Conditions Affecting Dam Trenches. Herbert Lapworth. (Abstract of paper read before the Assoc. of Water Engrs.) (14) Aug. 12.
- Concrete Lining for a Small Reservoir.* (14) Aug. 12.
- Construction Equipment for the Beacon Hill Reservoirs.* R. Rowntree. (14) Aug. 12.

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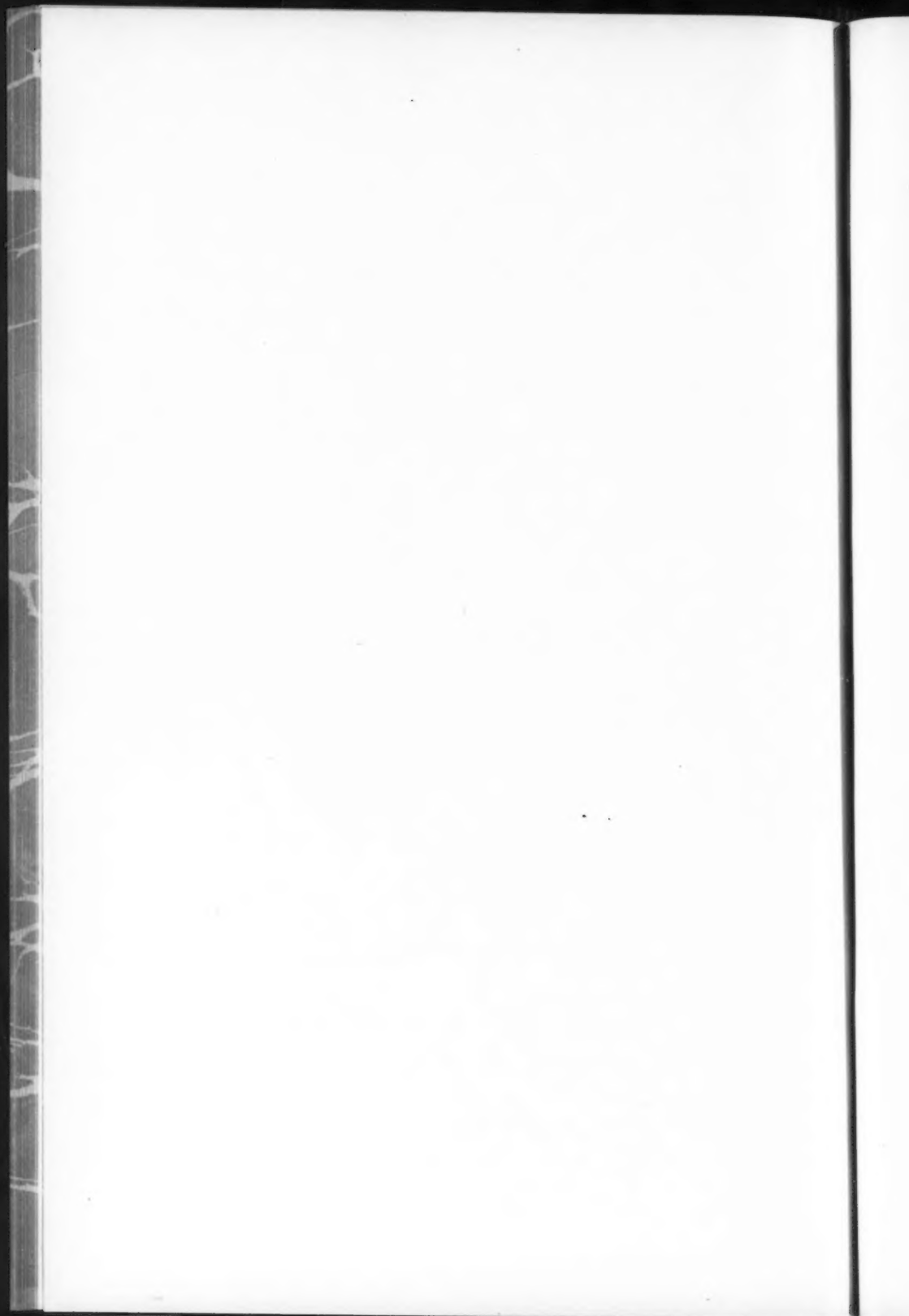
Water Supply—(Continued).

- Two Large Subaqueous Concrete Pipe Lines at Perth Amboy.* (14) Aug. 12.
 The New Hauser Lake Dam.* (14) Aug. 12.
 The Engineering Work of the Reclamation Service.* A. P. Davis. (46) Aug. 12.
 Electrolysis of Water Pipes in Nine American Cities, With Special Reference to Chicago Conditions. (86) Aug. 16.
 Pumping Water for Irrigation Compared With Gravity System; the High Line Pumping Co.'s Irrigation System, Idaho.* E. V. Berg. (86) Aug. 16.
 Method of Tapping a 36-In. Water Main Under Water, with Actual Costs.* (86) Aug. 16.
 6-Ft. Gate Valves for the Chicago 9-Ft. Water Tunnel; and a Design for a 9-Ft. Valve.* (13) Aug. 17.
 A Booster Pumping Station at Lorain, Ohio. (14) Aug. 19.
 A Unit Basis for First Cost of Hydro-Electric Plants. Farley Gannett. (14) Aug. 19.
 An Electrically Driven Pumping Plant for City Water-Supply at Oakland, Cal.* Gaskell S. Jacobs. (13) Aug. 24.
 A Remarkable Concrete Arch Dam.* (13) Aug. 24.
 The Corrosion of the 350-Mile 30-In. Coolgardie Steel Pipe Line, Western Australia. (13) Aug. 24.
 Water Turbines for Low Falls. (12) Serial beginning Aug. 25.
 The Blue Earth Hydroelectric Plant.* (14) Aug. 26.
 Converting Abandoned Mills Into Electric Power Plants.* T. Commerford Martin and Putnam A. Bates. (46) Aug. 26.
 The Cincinnati Water Works.* A. D. Blake. (64) Aug. 29.
 The Design and Construction of the Maiden Creek Slow Sand Water Filters at Reading, Pa.* Mandes Golder. (86) Aug. 30.
 Results of Government Investigations on the Cost of Pumping for Irrigation.* (86) Serial beginning Aug. 30.
 A 150 000-Gallon Reinforced-Concrete Tank, Savannah, Ga.* P. A. Fellows. (13) Aug. 31.
 The Adamello Water Power Station.* (96) Aug. 31.
 The Disinfection of Water. Rogers C. Perkins. (Paper read before the Ohio State Board of Health.) (96) Aug. 31.
 The Hydraulic Service of Quebec. Arthur Amos. (Paper read before the Canadian Forestry Convention.) (96) Aug. 31.
 An Irrigation Project on a Normally Dry River, Presidio County, Texas.* W. W. Colpitts, M. Am. Soc. C. E. (13) Aug. 31.
 The Significance of Flora and Fauna in Maintaining the Purity of Natural Waters and How They Are Affected by Domestic Sewage and Industrial Wastes. Emil Kuichling, M. Am. Soc. C. E. (Tr. from German article by Maximilian Mars-son.) (13) Aug. 31.
 The Beloit Water Rates Decision. (14) Sept. 2.
 The Municipal Water Purification Plant at Montreal.* (14) Sept. 2.
 The Extension of the Sweetwater Dam.* James D. Schuyler, M. Am. Soc. C. E. (14) Sept. 2.
 New Water Filtration Plant at Toronto.* (62) Sept. 4.
 Water Power Dam at Keokuk.* S. Kirlin. (64) Sept. 5.
 Methods and Costs of Cleaning Water Mains.* F. Osborne Bedford. (86) Sept. 6.
 Cost of Constructing a Reinforced Concrete Check and Delivery Structure for an Irrigation Canal.* H. M. Rouse. (86) Sept. 6.
 Experiments to Determine the Duty of Water on Irrigated Lands in Idaho. Don H. Bark. (Abstract of paper read before the Idaho Soc. of Engrs.) (13) Sept. 7.
 Concrete Cisterns and Filters.* (101) Sept. 8.
 Sluice Gates and Valves for the Catskill Water Works.* (14) Sept. 9.
 Paving Irrigation Reservoir Embankments. (14) Sept. 9.
 An Experience with a Water-Finder.* William Paul Gerhard. (14) Sept. 9.
 Canal Excavation by Sluicing.* Lyman E. Bishop, Jun. Am. Soc. C. E. (14) Sept. 9.
 Filtrés à Pates Poruses et Bougie Collodionnées. Francisque Grenet. (92) July.
 Les Limitateurs Automatiques de Débit et leur Récents Perfectionnements.* P.-A. Bergès. (33) July 29.
 Les Eaux Alimentaires de Liège en 1909.* Edmond G. Detienne. (30) Aug.
 Neuere Kraftübertragungsanlagen in Frankreich.* Adolf Ludin und Rudolf Buisson. (53) Serial beginning Aug. 11.
 Versuche an der Wasserkraftanlage der A. S. Tyssefaldene in Tyssadal bei Odde im Hardangerfjord.* Ernst Reichel. (48) Serial beginning Aug. 19.
 Die Wasserkraftanlagen der "Aluminium-Industrie-A.-G. Neuhausen" bei Chippis im Wallis.* J. Büchi. (107) Serial beginning Aug. 19.

Waterways.

- Dams on Sand Foundations: Some Principles Involved in Their Design, and the Law Governing the Depth of Penetration Required for Sheet-Piling.* Arnold C. Koenig, Assoc. M. Am. Soc. C. E. (54) Vol. 73.

*Illustrated.



Waterways—(Continued).

- Methods and Cost of Constructing Main Canals and Laterals for the Willow River Land and Irrigation Project in Malheur County, Oregon.* H. L. Dickerson. (86) Aug. 2.
- The 115 000-Acre Drainage Project of the Fellsmere Farms Company, Florida.* E. Nelson Fells. (86) Aug. 2.
- Electrically Operated Emergency Dam at the "Soo" Locks.* (27) Aug. 5.
- The Improvement of New York City Freight Terminals. (14) Aug. 5.
- Assorting and Distributing in Water-Front Freight Handling. H. McL. Harding. (14) Aug. 12.
- Grand Trunk Pacific Ry. Dock at Seattle.* (18) Aug. 19.
- Barge Canal Terminals. H. McL. Harding. (14) Aug. 26.
- Lock Valves, Bearings and Roller Trains: Awards for Panama Canal Work. (62) Aug. 28.
- Tonawanda and North Tonawanda, N. Y., Concrete Retaining Walls, Contract No. 19, New York State Barge Canal.* Emile Low, M. Am. Soc. C. E. (86) Aug. 30.
- The Largest Movable Wicket Dam.* (46) Sept. 2.
- Pushing Work on Docks at Panama Canal. (62) Sept. 4.
- Work on the New Lock and Canal at Sault Sainte Marie, Mich.* (13) Sept. 7.
- Le Port Fluvial de Karlsruhe (Grand-Duché de Bade).* Charles Aubert. (33) Aug. 12.

*Illustrated.